NOLOGY DEPT.

Gas Journal

VOL. 288. 108th YEAR. LONDON, NOVEMBER 14, 1956. No. 4870 PRICE 1/6

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A

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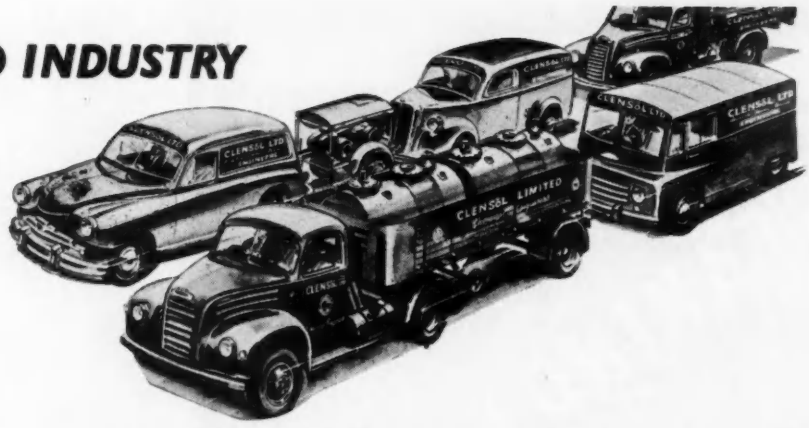

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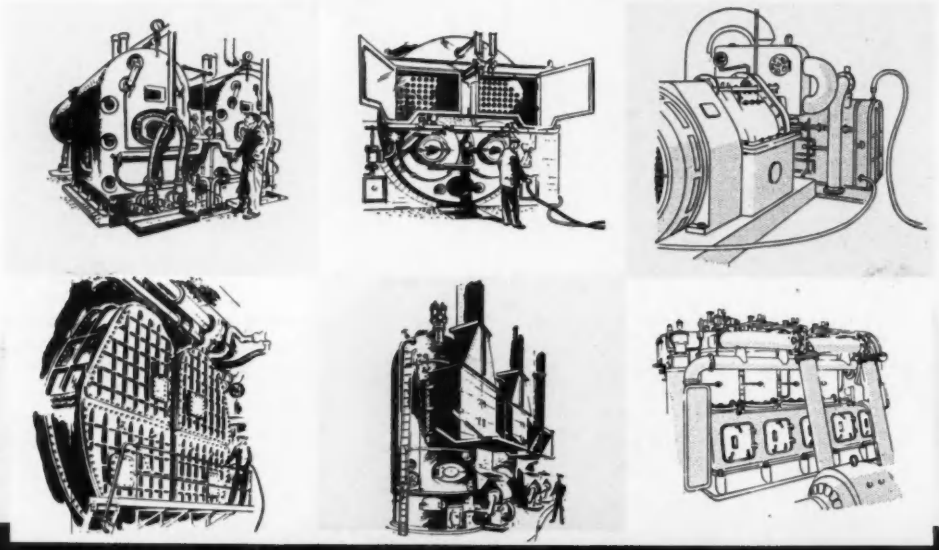

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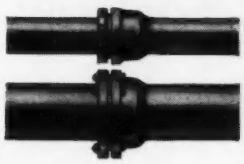

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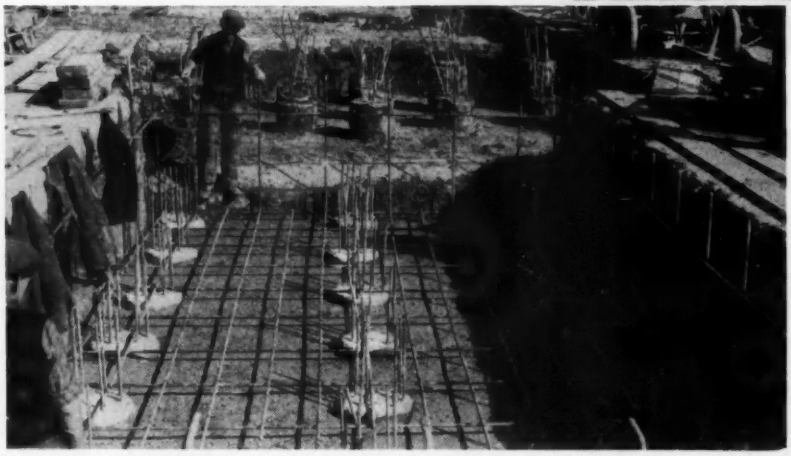

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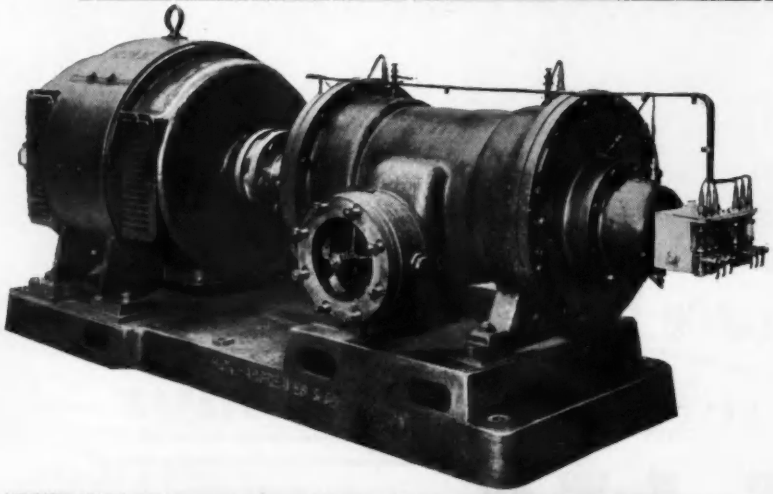

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The illustration shows an air-cooled Compressor for 15 p.s.i.g. Also available as a water-cooled machine for h.p. distribution.

H.106A.

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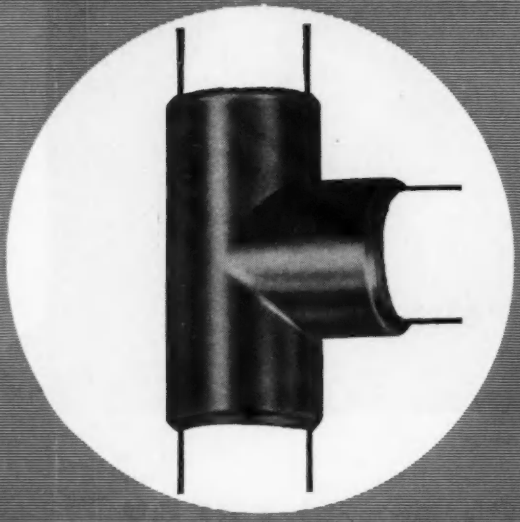

'Intex P.T.' is the *original* pre-tinned capillary tube fitting. Neat, strong, streamlined joints, unaffected by vibration, expansion or contraction, can be made easily and quickly with 'Intex P.T.' fittings and solder paint or wire. The tinned bore dispenses with laborious cleaning.

I.C.I. makes a full range of fittings for copper tubing to B.S. 659 and B.S. 1386. I.C.I. tubes and fittings together make the ideal plumbing installation.

1 CLEAN, APPLY SOLDER PAINT AND INSERT TUBE

2 HEAT

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. . . a perfect joint with I.C.I. 'INTEX P.T.' fittings

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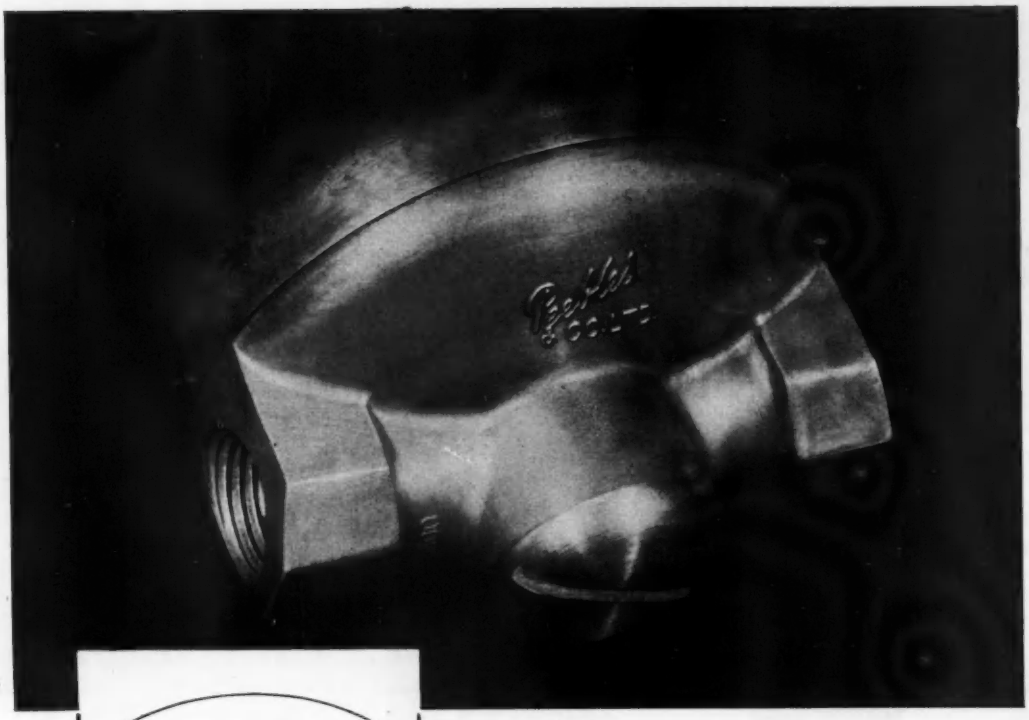
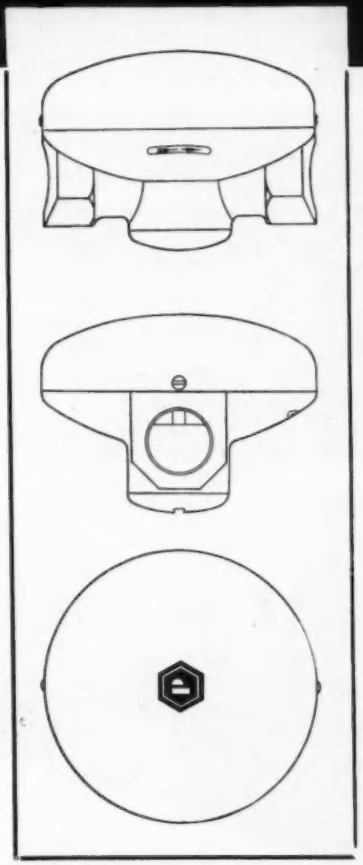
P25





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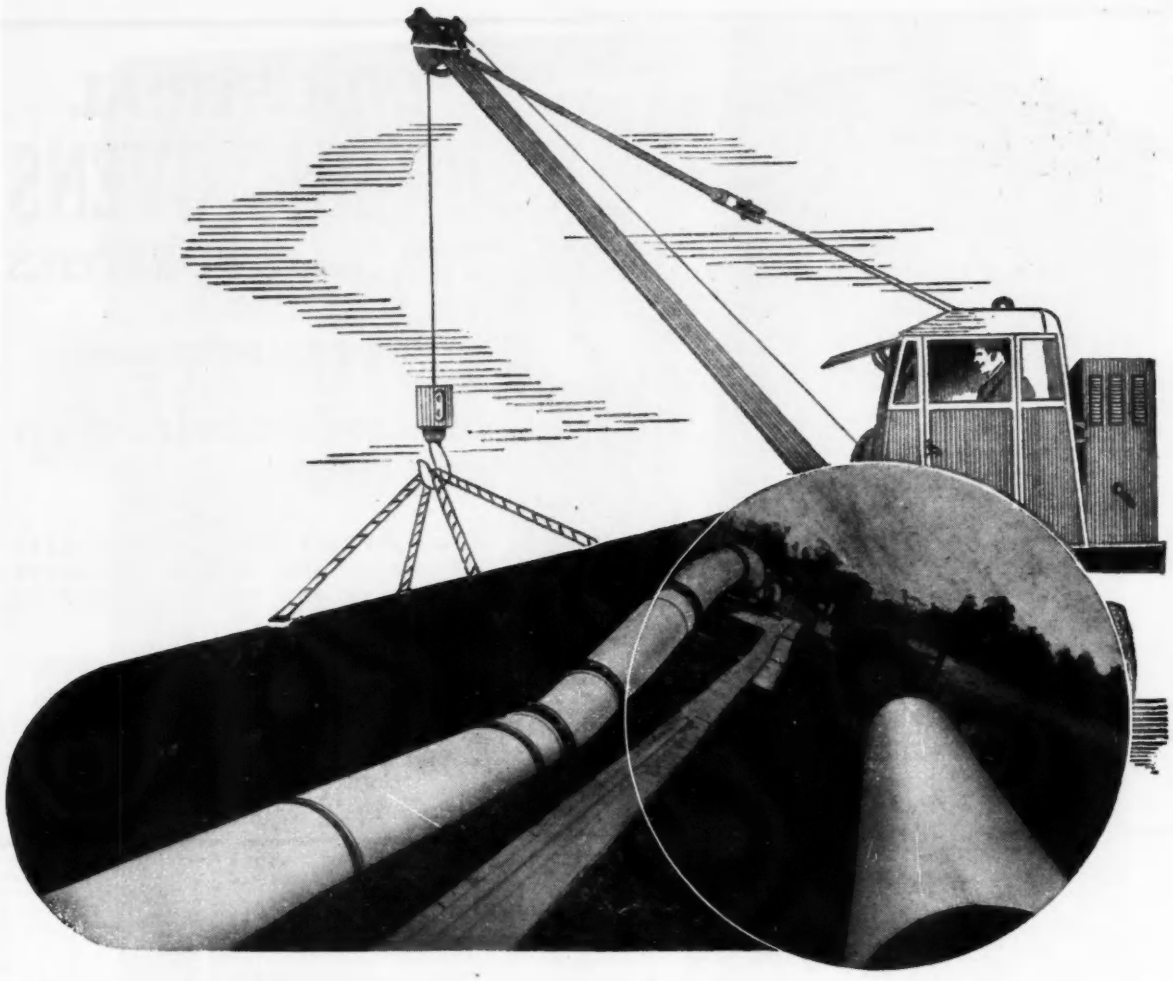

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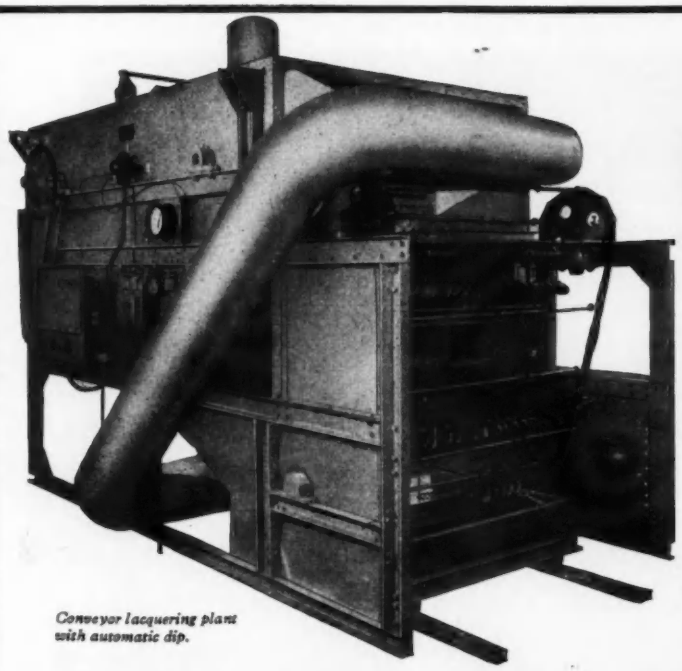

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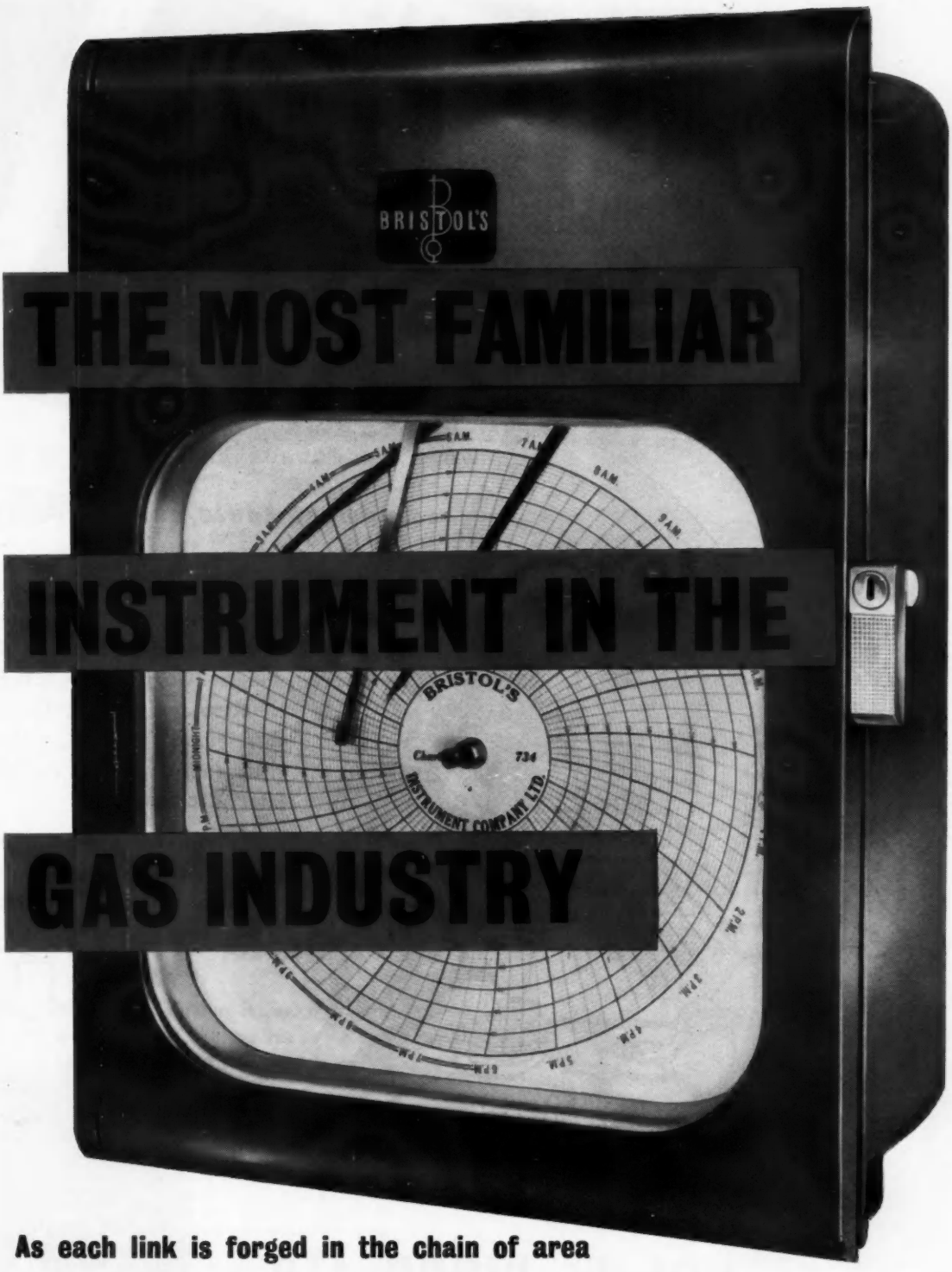

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F.S.31

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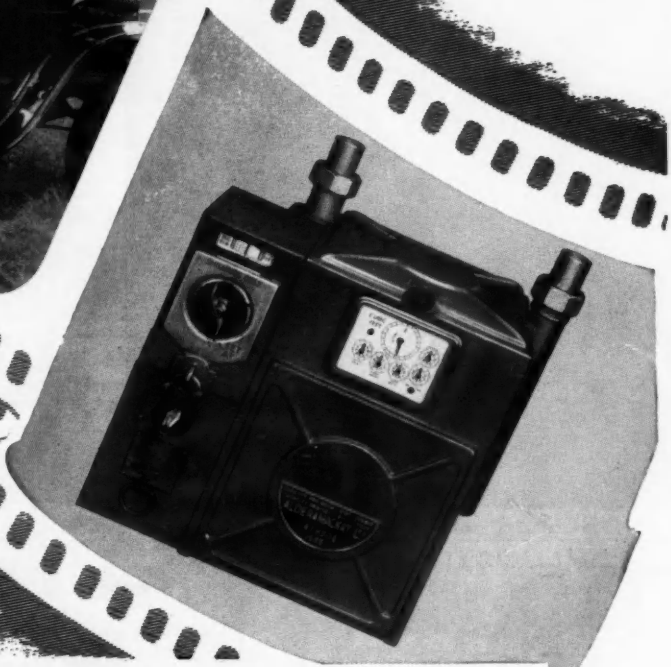
Photo by courtesy of the J. Arthur Rank Organisation.

'In the picture' with A. & M.



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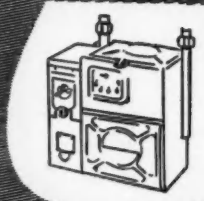
THE MINIMETER is the famous SMALL SCOTCH that gives Trouble-Free Running in most compact form



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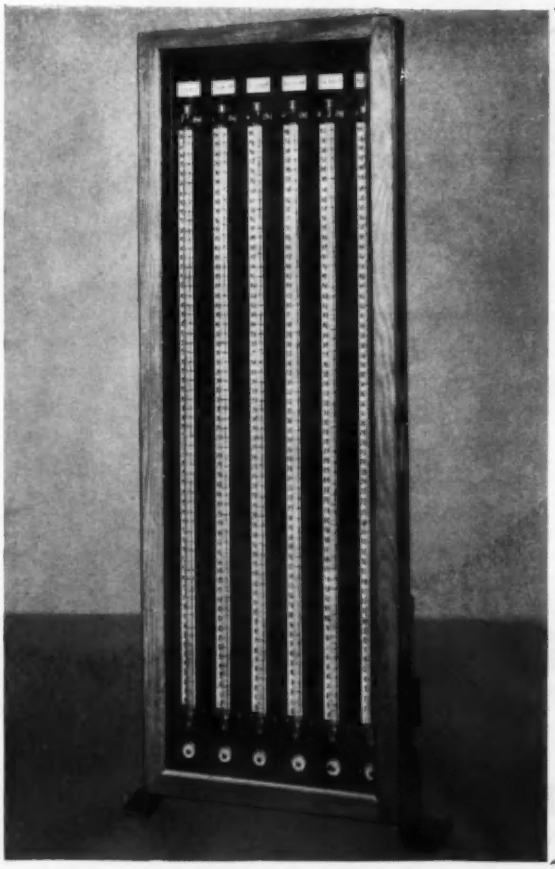

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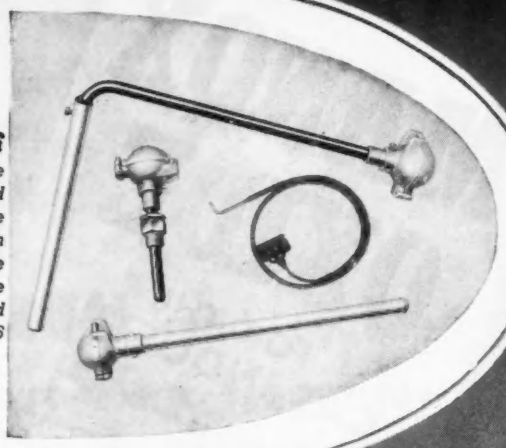

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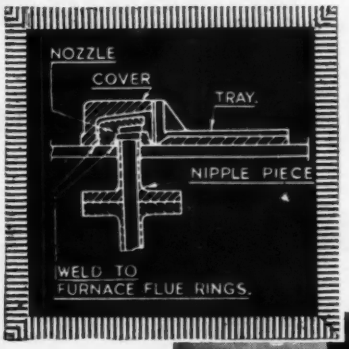
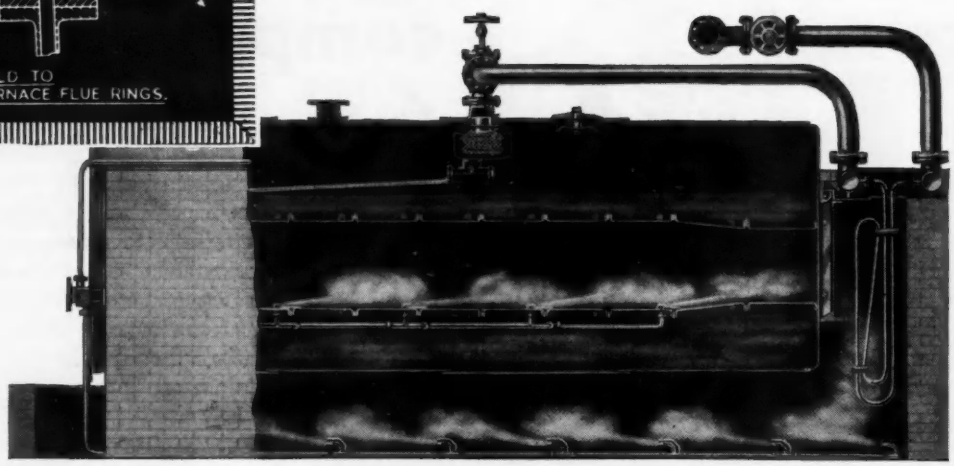
OF COAL PER ANNUM and reduce boiler shut-down frequency



Repeated tests have shown that boilers fitted with "Bolton-Gray" Patent Ash Blowing Equipment absorb 7 per cent more heat than boilers without this equipment.



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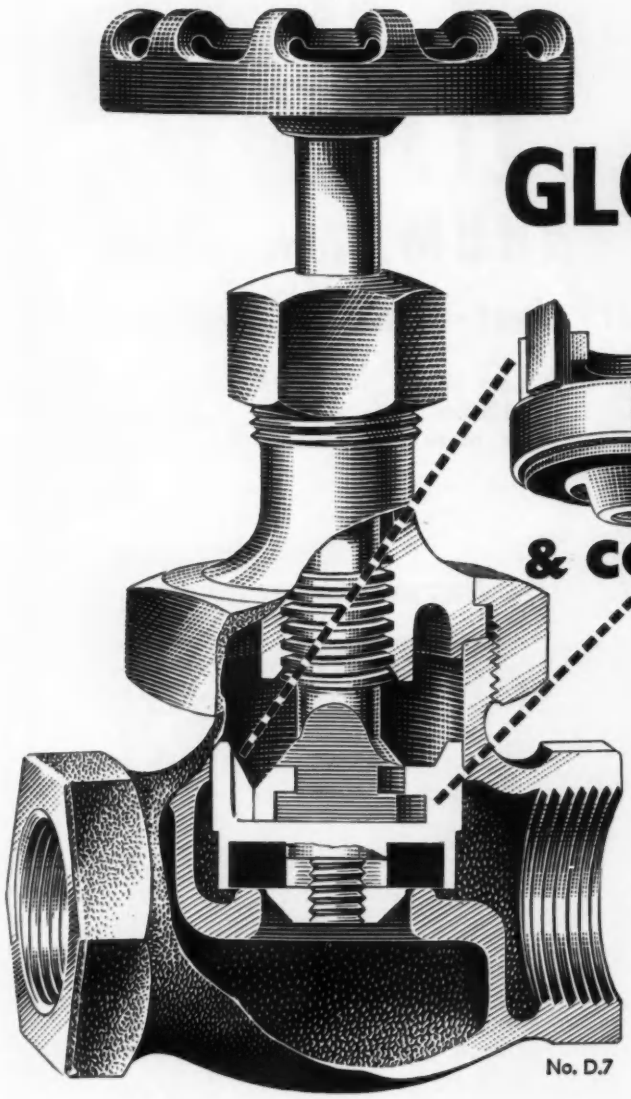

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BRONZE GLOBE VALVES

—WITH THE

renewable disc holder & composition disc

SCREWED OR FLANGED

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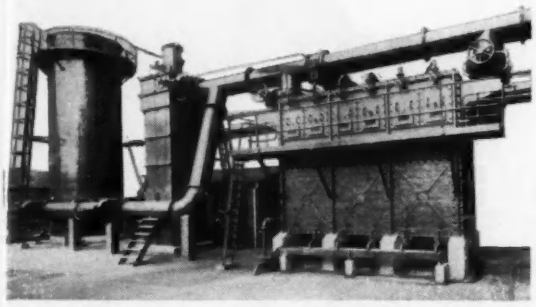
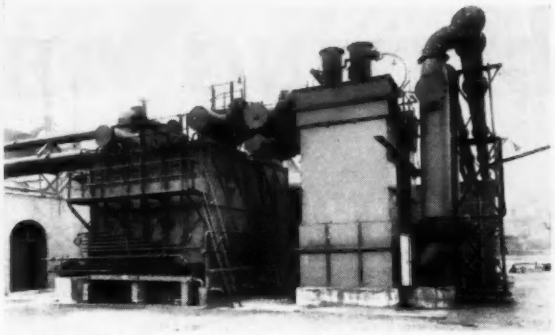
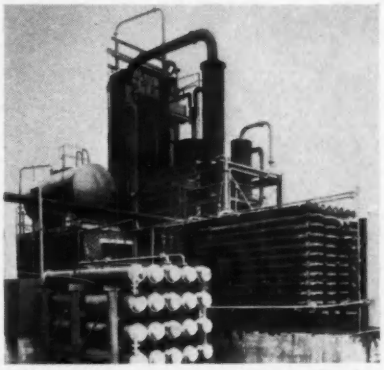
PLANT FOR THE GAS INDUSTRY



Wet purification plant comprising mild steel condenser, cast iron ammonia washer and plate-type electro-detarrer at Norwich for Eastern Gas Board.



Washers and detarrers at New Wortley for North Eastern Gas Board.



Effluent liquor treatment plant for Southern Gas Board.

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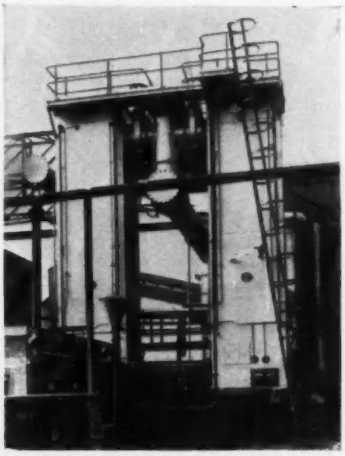
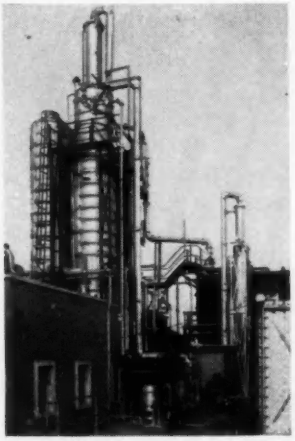
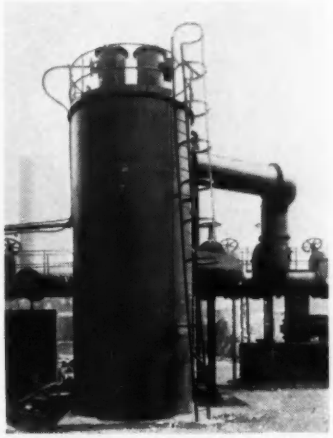


Mild steel vertical water-tube condensers at Bristol (Canon's Marsh Gasworks) for the South Western Gas Board.



Concentrated ammonia liquor plant at Bristol for South Western Gas Board.



Tube-type electro-detarrer at Oldham for North Western Gas Board.

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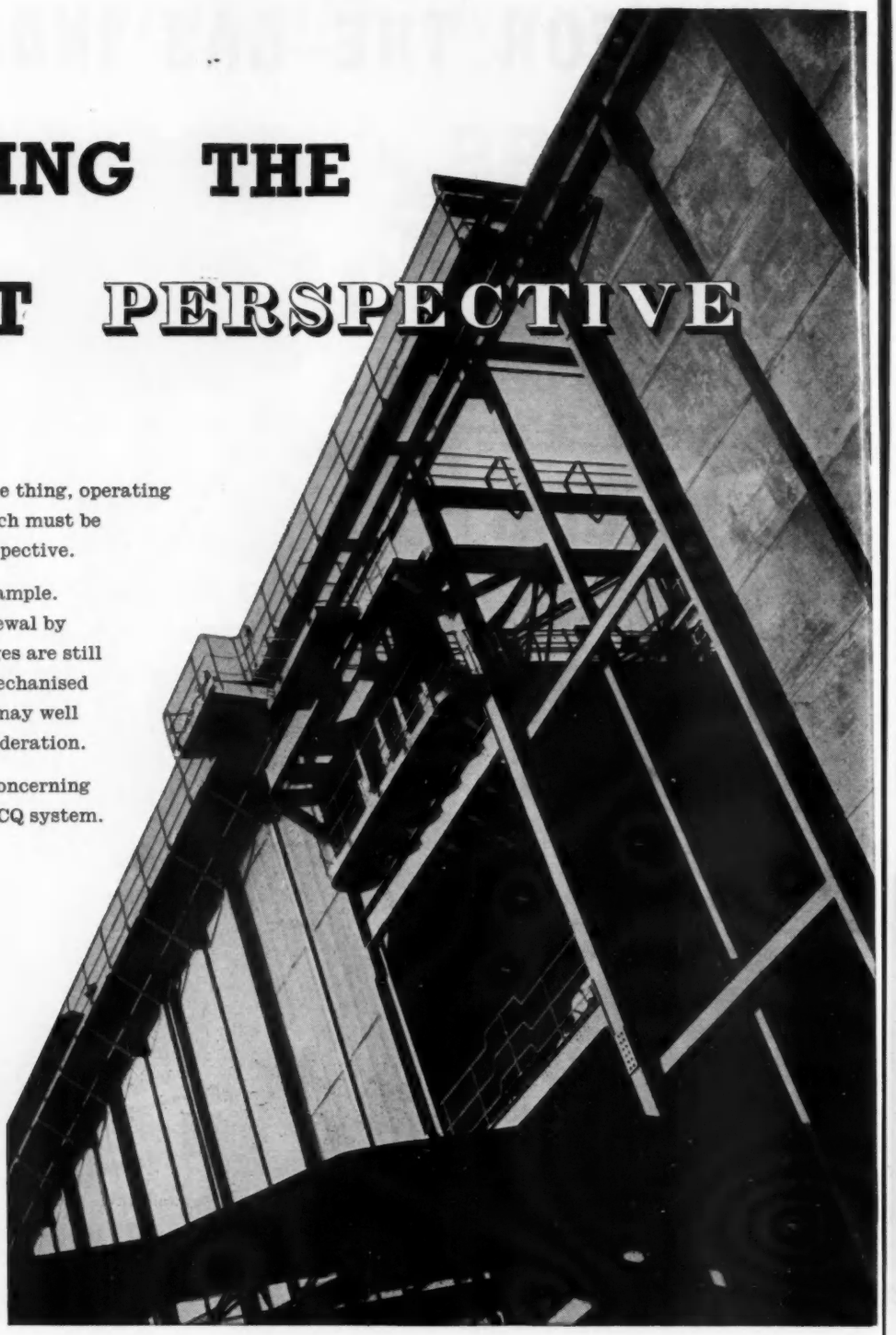

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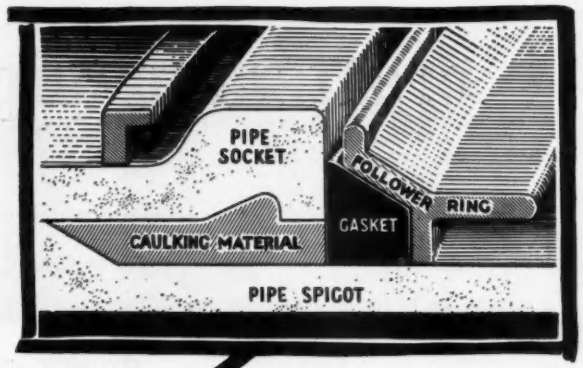

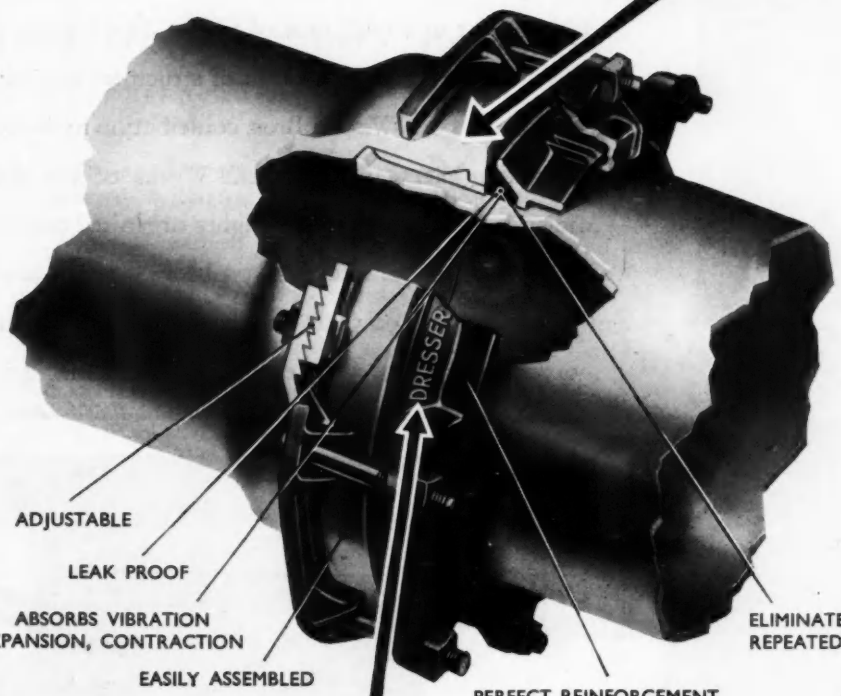

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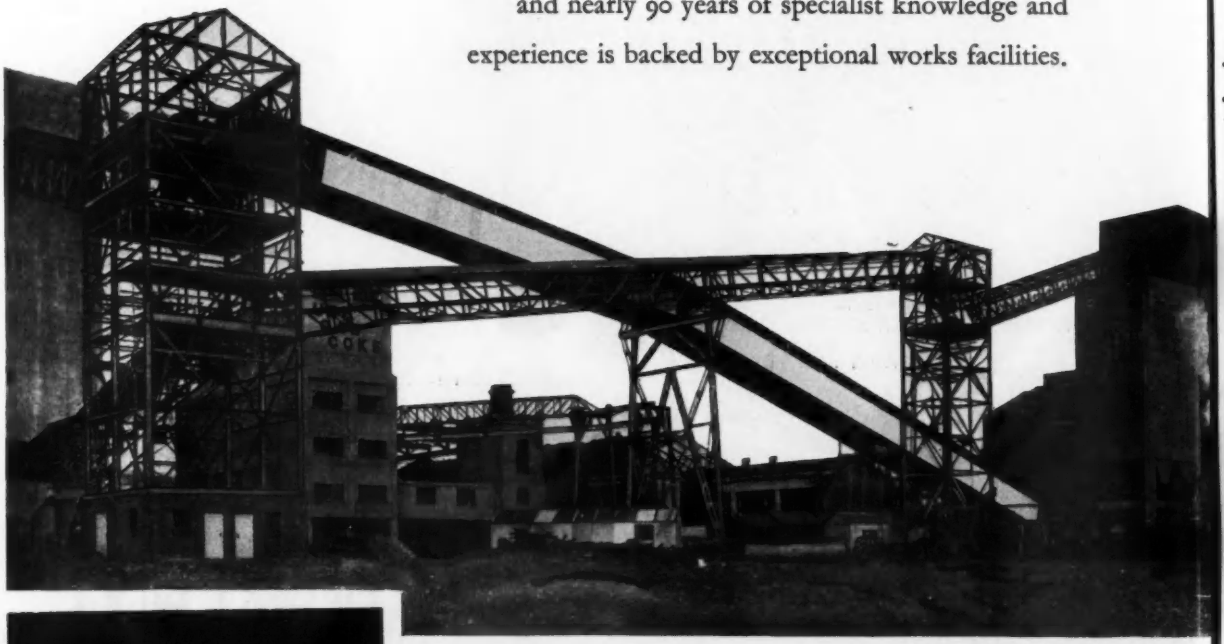

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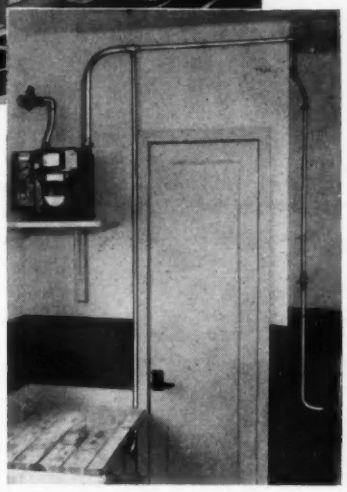

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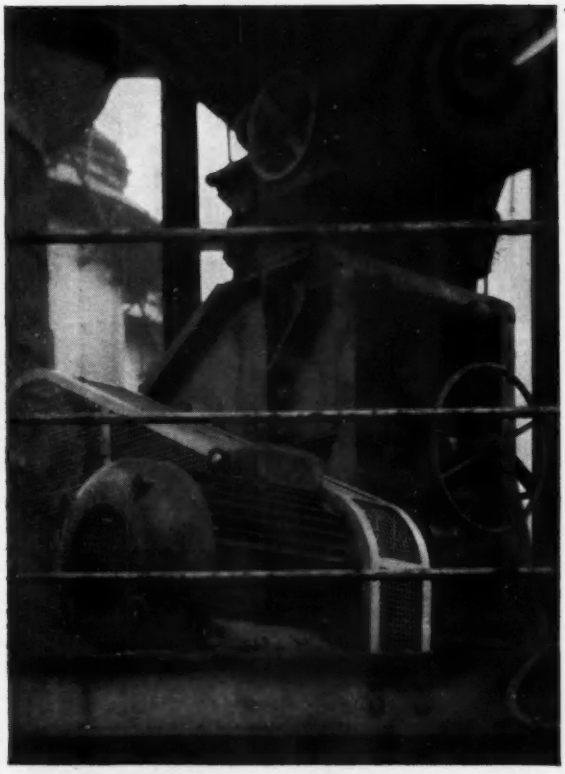

A fine installation for OXIDE CRUSHING

This installation at a large Midland Gas Works has a B.J-D Oxide Crusher, which is doing a really good job of work. Feed is by hopper, as shown in the picture ; discharge is on to a conveyor. The B.J-D Oxide Crusher is also available as a mobile unit, mounted on a bogie; the most recent version of bogie shows a considerable saving in cost, whilst still retaining the necessary strength and efficiency. We shall be happy to give you further details on request.

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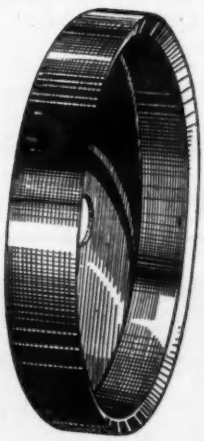

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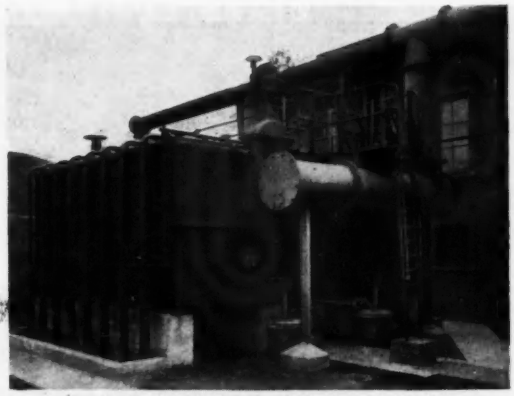
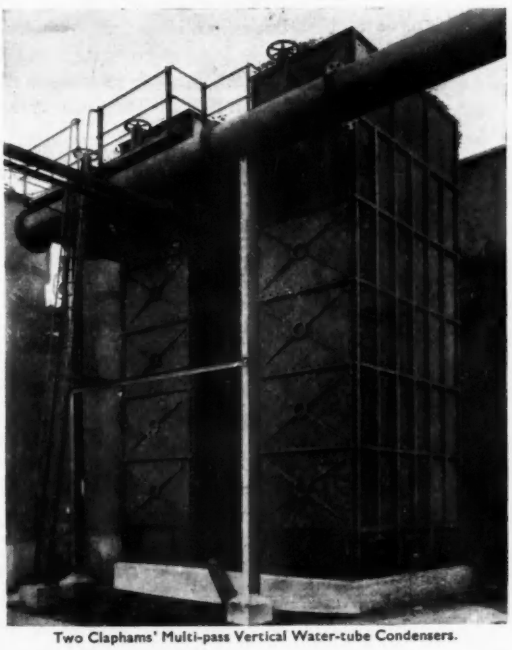


Two Clapham-Barwick Pumpless Static Ammonia Washers

Internal deck level view of the Purifier Installation. (Eight 45 Feet Square Boxes)



Two Claphams' Multi-pass Vertical Water-tube Condensers.

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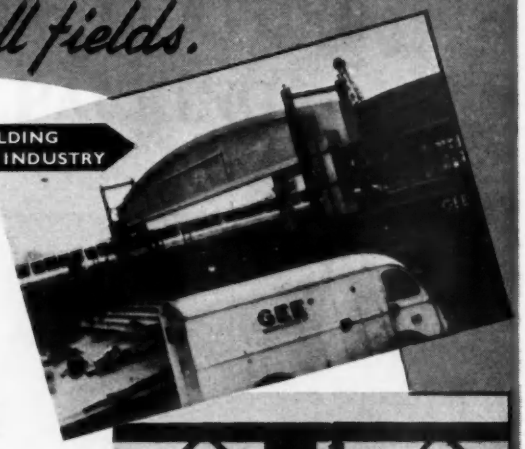

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For example, the top illustration shows one of a number of giant roof-beams 60 ft. long and weighing 5 tons which were lifted in stages into position from ground level. So much positioning of high-tonnage jacks in this job made the Hydralite an invaluable tool.

Construction of a Bailey Bridge, shown in the second picture, requires Jacks at every stage and Thomas Storey Limited, who have the sole manufacturing rights of the bridge for civilian use, use Tangye Hydralites.

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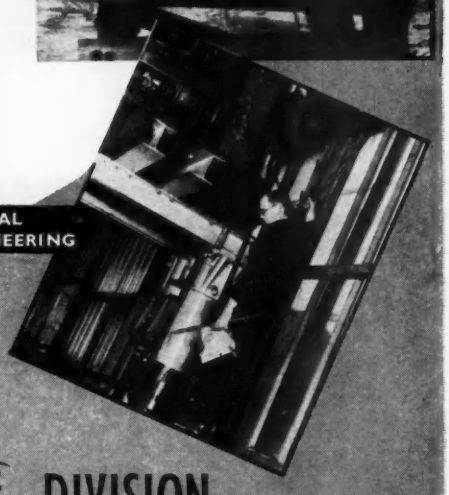

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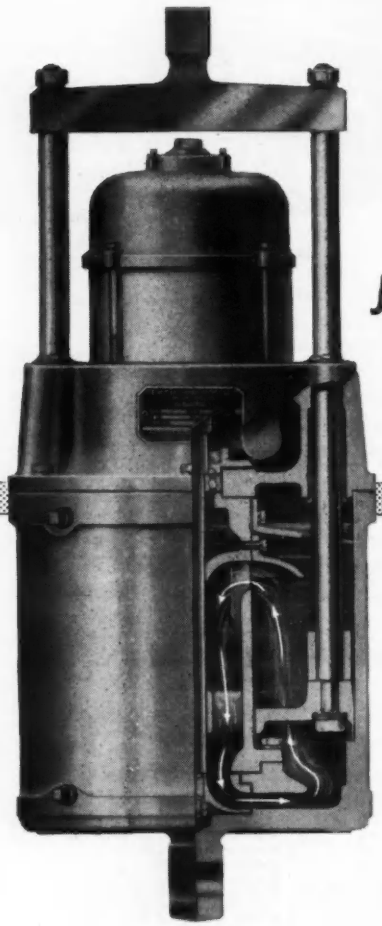

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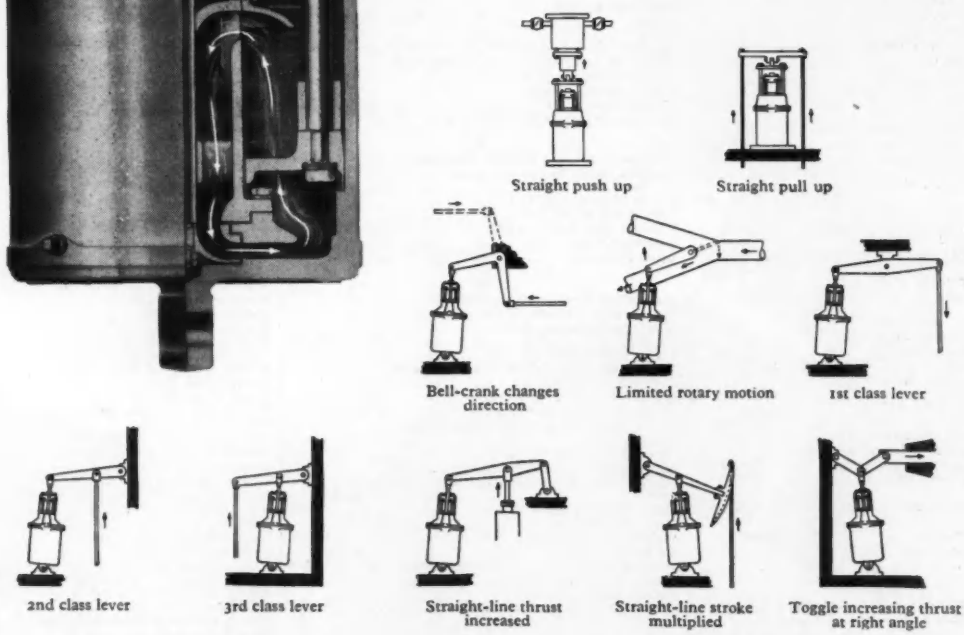

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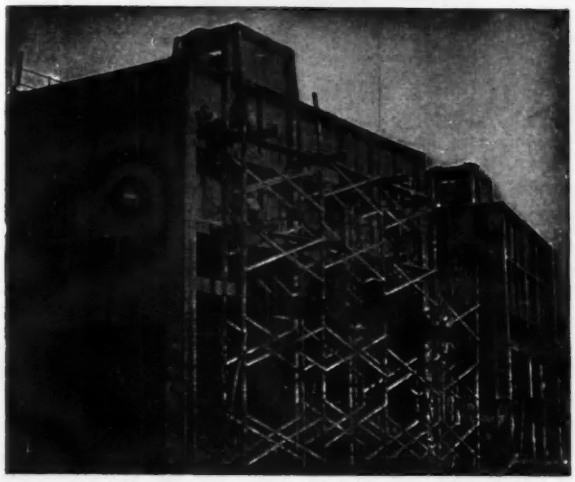

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Gas Journal

VOL. 288 *NO. 4870* *November 14, 1956*

108TH YEAR

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PUBLISHERS' NOTICE, See Page 383, November 7, 1956

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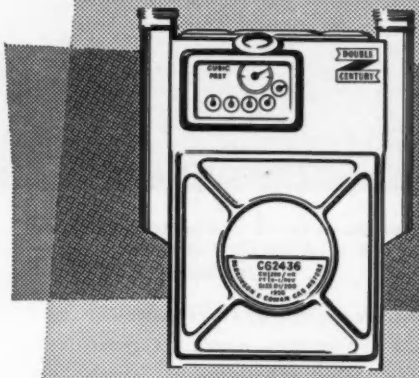

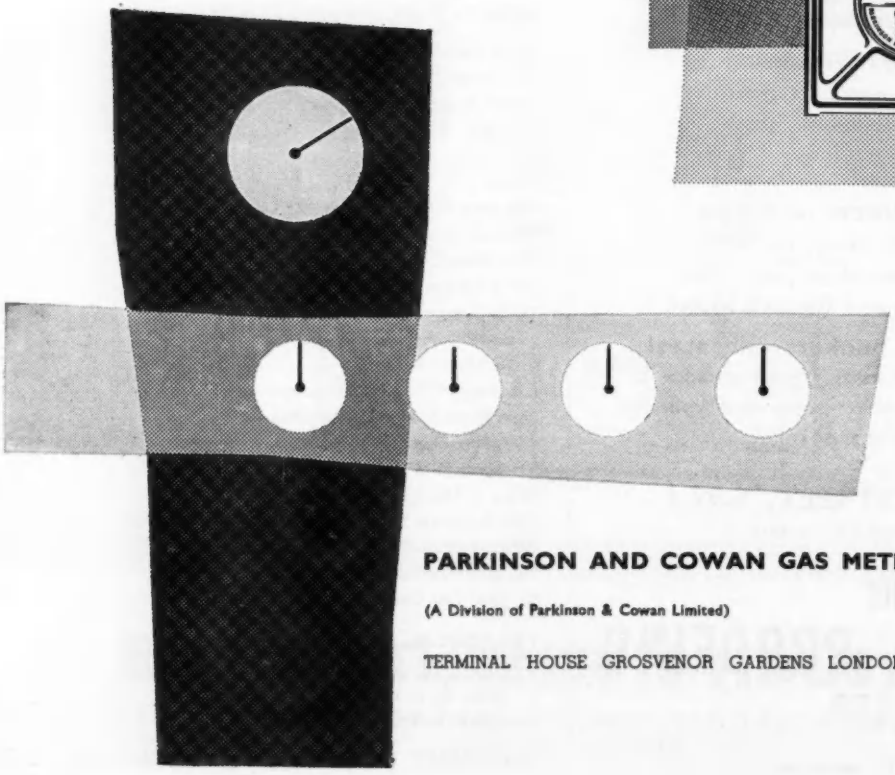

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Gas Journal

VOLUME 288. No. 4870. NOVEMBER 14, 1956. 108th YEAR

The East Midlands Sales Conference

A SIGN saying 'Under New Management—Business as Usual' would not have been inappropriate outside the venue of the East Midlands Gas Board's sixth annual Sales and Service Conference, held in Leicester last week. In place of the familiar figure of Mr. Sidney Smith at the helm we had Mr. R. S. Johnson who steered the ship through calm waters with characteristic deftness. And if Mr. H. R. Hart, the Board's former Commercial Manager, was conspicuous by his absence, at least those present were able to have a look at his successor, Mr. L. F. Randall, who will be taking up his duties on January 1.

Mention of Mr. Hart in this connection is inevitable since he has always been the chief architect of the conference, the programme of which has revealed his determination to widen the vision of his sales staff by giving them a fuller understanding of the whole pattern of retail selling—marketing, advertising, public relations, and so on. Almost all the speakers have come from the great wide world outside the gas industry wall and have been formidable figures in their respective professions. In many ways this policy is a sound one, but like all good things it is possible to have too much of it. That, we hasten to add, is no reflection on this year's speakers who represented the advertising, marketing and industrial design fields. But it was significant that at no point in their addresses was there any reference to a way in which the ordinary gas salesman could do his job better. The speakers might have come from another planet so remote was their business from the *active participation* of their audience. And, on reflection, it is also significant that the most successful address ever given at this function was by one of the Board's own home service advisers. Future planners of the conference might bear this point in mind, and also the desirability of permitting, by discussion, some inter-play of opinion between Board and employees. In the perfect conference, platform and audience must somehow meet half way; otherwise the effort is as unsatisfactory as a one-sided love affair! If the planners can achieve this rapport and at the same time retain the existing smooth organisation and convivial atmosphere there will be no similar meeting in the industry to touch it.

Mr. Johnson did not leave his listeners in doubt concerning his attitude to sales and service, and salesmen's hearts must have been gladdened by his assertion, in the presence of engineers, that he did not subscribe to the belief held by the production and technical side of the industry that selling was a somewhat subordinate activity. On the contrary. 'Let me assure you,' he said, . . . 'that I am intensely interested in our selling activities . . . perhaps it would be more correct to say that I am concerned about selling.' He went on to explain the vulnerability of his Board in which only 40% of the gas sold goes to the domestic consumer. 'We cannot be satisfied with no more than 100 therms per domestic consumer per annum,' a figure 12 therms below the national average.

Thereafter the guest speakers took over and the emphasis was entirely on women. Mr. A. Lloyd Taylor deputised for his co-Director, Mr. Richard Lonsdale Hands, and presented the latter's paper on 'Selling and Design' in which he said the term 'housewife' was an anachronism and should be abolished. 'I have never advocated that women should be wedded to their cookers rather than to their husbands. To my mind the housewife should be abolished. She is an anachronism. It is up to us to see that British women have time to lead the life they deserve. Our motto should be: Exit the housewife—enter the wife.'

This was slightly at variance with the views on her sex expressed by Miss Sylvia Weinberg, Joint Managing Director of Armstrong-Warden Ltd., the advertising and marketing agency. 'I am not a feminist,' asserted Miss Weinberg, thereby making the under-statement of the year. She went on to explain that 80% of consumer goods in this country are bought by women and that 70% of goods used by men are bought by women. That being so, what could be more natural than for women to do the selling? The spread of self service shops cannot affect household equipment, she believes, and the future of that market lies through women and with the active advice of women. A woman with selling experience is in a unique position, being as it were on both the giving and the receiving end. When a woman sells to a woman she can do the job much more convincingly.

'It takes a woman to understand woman's logic. She has the ability to appreciate detail and the ability to see the operational snags, particularly in the kitchen. Woman weakens man's sales resistance but more important is woman's place at management level. Industry is already realising that women in an advisory capacity are worth their weight in gold. Their special aptitude makes their position essential—I put it no less.'

Thus spake Miss Weinberg, a compelling and experienced speaker. Her arguments were interesting and, if correct, disturbing. Certainly they were disturbing for this particular audience since the implication was that if the Board is to succeed in the years to come it must change most of its predominatingly male sales force in favour of what we foolishly used to think of as the gentle sex. For our part we think Miss Weinberg is half right and we would like to see some careful experiments made with showrooms staffed wholly or predominantly by women. But we have no doubt that there were sections of the audience of both sexes which were dying to comment on this provocative address. It was a pity they had no opportunity for doing so. After all, this is a matter of the greatest importance, affecting the very roots of our sales policy. We cannot afford either to accept or brush aside the opinion of an accepted expert in the field without the most careful consideration.

Complete Gasification

THE Tully complete gasification process consists essentially in distilling coal in a type of vertical retort superimposed over a water-gas generator. The coke (so far a very 'low temperature' product) is gasified in the latter by the usual water-gas reaction in a cycle of blowing and steaming. The retort is heated externally by the blow gases and internally by the hot water-gas. The resultant mixture of coal gas and water gas may reach a calorific value of 330 to 340 B.Th.U. per cu.ft. but in recent developments provision is made for enriching by means of petroleum oils (gas oil, fuel oils) or in some cases tar, in an attached carburetter so that calorific values up to 500 B.Th.U. per cu.ft. may be obtained.

Mr. Hartill, in the paper appearing on p. 441, which he presented to the Manchester and District Section of the I.G.E. in Huddersfield on October 19, described the interesting developments which had been carried out on a small 'two-stage coal-water-gas plant' of the Tully design erected at the Kendal gasworks—and the resultant much larger plant now working at Wallasey in which some of these developments are incorporated.

The general impression given by the unfortunately brief discussion and by the paper itself is that this plant is still limited in the types of coal with which it can deal. The selection of suitable coals is a problem which does not appear to have been solved. Mr. Hartill confessed that he and his collaborators had been forced to change from time to time their opinions in this matter and that they could not, as yet, offer any final conclusions. Neither swelling index nor agglutinating properties provide the complete answer though methods worked out in France in connection with the somewhat similar G.I. plant at Vierzon and elaborated by the Tully technicians indicate that these values, together with the proximate analysis do enable a reasonable decision to be made in the selection of suitable coals.

Mr. Hartill's 'interim' conclusion that rank 802 coals are the most suitable 'with rank 702 coals excluded because of their greater agglutinating power and rank 902 coals excluded because of the fragile coke they produce' may be a rather too broad a statement to be accepted at the present time.

Most of the coals that have been gasified satisfactorily in complete gasification plants have come from the Scottish coalfields but we have been informed that suitable coals have also been obtained from the Northumberland and most of the English and some of the Welsh coalfields. These coals are included in the ranks 200, 300, 700, 800, and 900, and in many cases are coals which do not lend themselves to the production of satisfactory coke; it would appear that the National Coal Board's classification is not a safe guide for the selection of coals for complete gasification purposes.

The installation of the Wallasey complete gasification plants by the North Western Gas Board for the production of town gas and for the further investigation of the carburetted complete gasification process is most commendable but it would appear that if this process is to be employed for town gas manufacture, then further developments are necessary to accept a wider range of coal types. It is suggested that complete gasification gas would provide a useful medium for the carrier gas (Rochdale) technique in continuous vertical retorts.

The last word has not been spoken at Wallasey but there appears evidence that further developments are possible. Mr. Collinge pointed out that 30 years ago he was obtaining in a Travers & Clarke plant at Preston thermal yields well in excess of those already quoted.

Interest in complete gasification will no doubt be sustained but it was Mr. Litler who brought us back to the fundamentals of the position of the gas industry in the economy of the nation. Mr. Greaves remains a firm believer in a two-fuel industry. Others look to an all-gas industry but there is no real conflict here. Mr. Litler foresaw, no doubt correctly, that the immediate result of the implementation of the Clean Air Act would be to increase the demand for solid smokeless fuel—in a plain word, coke—for the next ten to 20 years. He believed demand for solid smokeless fuel would reach its peak in from 15 to 20 years but that after that the housewife would demand heat through a pipe or through a wire. It was up to us to see that she got it through a pipe.

Forthcoming Discussions

THE programme of subjects to be discussed, up to the end of the year, in the several sections of the Institute of Fuel, is now published in the *Journal of the Institute*. Apart from the usual fuel subjects based on coal, there is a continuing interest in the implication of the Clean Air Act, in the use of oil, and in nuclear energy; but there are are also some papers on gas manufacture.

London began on October 10 with some current investigations into the properties of Australian coals discussed by H. R. Brown, who has been largely responsible for the formation of a lively section of the Institute in that Dominion. Dr. L. C. Tyte is to present a paper to the North Eastern Section in December on 'The physical properties of coal and their influence on coal winning,' while 'Problems of coal production and preparation'

re to be discussed by W. G. Harper and N. W. Hill at Sheffield on November 21.

Nuclear energy was the subject of a paper on 'Nuclear reactors for power production,' F. M. Greenlees, in London, on October 31, and a 'Preliminary paper on nuclear energy,' by I. Hopkins, at Manchester on October 24; the North Eastern Section discussed 'Electricity from nuclear power' on October 1.

The Clean Air Act and allied subjects are covered in 'The cost of air pollution in Britain,' by R. S. Scorer, in London on November 28, 'A discussion of proposed amendments to the Bill' to be staged by the Midland Section in Birmingham on November 14 at a joint meeting with the local division of the National Smoke Abatement Society, 'The Law, the Public Health Department and the Fuel User,' by Professor Semple, at Liverpool on December 6, and 'Automatically controlled small-pipe central heating,' by D. V. Brooke and collaborators, at Glasgow on December 10—while Dr. Foxwell is to present a summary of the London Conference of last May on Domestic Heating to the North Eastern Section in Newcastle on December 3; the East Midland Section held a forum on the same topic with the title 'Relative costs of use of solid, liquid, and gaseous fuels and electricity' on October 4.

General fuel problems are to be discussed in 'United Kingdom fuel and power,' by Dr. Haber, in London on December 5, and 'The use of local energy resources in undeveloped areas,' by E. W. Golding, at a joint meeting with the Electrical Engineers of Scotland at the Heriot Watt College, Edinburgh, on November 23. Subsidiary questions will be covered in a number of papers on the use of oil in many fields, one on the 'Heat pump in Great Britain,' by Miss U. V. Griffith at Liverpool on November 15, and one on the 'Maintenance of high efficiencies in economic boilers,' by I. S. Groundwater, in Glasgow on October 25.

Papers of interest to the gas engineer are, first, the Melchett Lecture of November 15 in London to be delivered by Sir Alfred Egerton on a subject he has largely made his own, 'Methane and its combustion,' and perhaps second, a discussion of L. J. Clark's classic paper, 'Steam and power in the gas and coking industry,' at a joint meeting in Manchester on December 7 with the Manchester and District Section of the Institution of Gas Engineers. Others are, 'Recent trends in the manufacture of town gas,' by K. J. Crane, in Birmingham on November 22, 'The manufacture of town gas from liquid and gaseous fuels,' by E. J. Lawton, in Newcastle on November 5, and 'Design and performance of modern gas-cleaning equipment,' by G. J. Stairmand, at a joint meeting with the North Western Division of the Smoke Abatement Society in Manchester on November 14.

A novel item is an address by A. R. Cooper to the North Western Section in Manchester on December 19 in his 'Recent visit to the U.S.S.R.'

I.G.E. Autumn Research Meeting

THE 22nd Autumn Research Meeting of the Institution of Gas Engineers will be held on November 20-21 under the Presidency of Sir Henry Jones, M.B.E. The programme will be:—November 20, *9.30 a.m.*, opening of meeting. Presentation and discussion of the 17th Report of the Chairmen's Technical Committee: 1955-56. (*Communication No.* 492.) *10.15 a.m.*, presentation and discussion of the 33rd Report of the Gas Education Committee: 1955-56. (*Communication No.* 493.) *10.55 a.m.*, presentation of medals, diplomas, and prizes. *11.05 am.*, presentation without discussion of a report on the Gas Council research scholarships. (*Gas Council Research Communication GC*36.) *11.15 a.m. to 12.15 p.m.*, presentation and discussion of paper 'Coal Science and the Gas Industry,' by D. T. A. Townend, Director General, The British Coal Utilisation Research Association. (*Communication No.* 494.)

Afternoon—*3 p.m.*, presentation and discussion of the 47th Report of the Joint Refractories Committee: 1955-56. (*Gas Council Research Communication GC*30.) *4 p.m. to 5 p.m.*, presentation and discussion of paper, 'The Hydrocarbon Content of Fuel Gases,' by A. L. Roberts, J. H. Towler and B. H. Holland. (*Gas Council Research Communication GC*31.)

November 21—Assembly Hall, *10 a.m.*, presentation and discussion of paper, 'Heat and Mass Transfer Coefficients in Gas Works Plant Design,' by G. S. Cribb and E. T. Nelson. (*Gas Council Research Communication GC*32.) *10.45 a.m.*, presentation and discussion of paper, 'The Measurement of Gas Stream Temperatures in Industrial Appliances,' by P. G. Atkinson. (*Gas Council Research Communication GC*33.) *11.30 a.m. to 12.15 p.m.*, presentation and discussion of paper, 'Forced Recirculation in Industrial Gas Appliances,' by W. E. Francis. (*Gas Council Research Communication GC*34.)

Hoare Memorial Hall, *10 a.m.*, presentation and discussion of paper, 'The Prediction of the Combustion Characteristics of Town Gas,' by M. G. Gilbert and J. A. Prigg. (*Gas Council Research Communication GC*35.) *11 a.m. to 12.30 p.m.*, presentation and discussion together of the following papers: 'Experiments with Shared and Individual Flues for Gas Appliances,' by W. J. Bennett and C. H. Purkis. (*Communication No.* 495.) And 'Observations on the Performance of a Multi-flue System and of a Single Duct for Appliances with Room-sealed Combustion Chambers,' by J. B. Carne and T. T. White. (*Communication No.* 496.)

Afternoon—*2.30 p.m.*, presentation and discussion of paper, 'Experiments on the Hydrogenation of Oils to Gaseous Hydrocarbons,' by F. J. Dent, D. Hebden, F. C. Wood and T. A. Yarwood. (*Gas Council Research Communication GC*37.) *3.45 p.m.*, presentation and discussion of paper, 'Consumer Research,' by H. R. Hart. (*Communication No.* 497.) *4.45 p.m. to 5 p.m.*, concluding business of meeting.

Christmas Lecture

THE sixth Christmas lecture for young people under the ægis of the Institution of Gas Engineers will be given in the Large Hall of the Sir John Cass College, Jewry Street, Aldgate, E.C.3, on January 1, 1957, at 2.30 p.m.

The lecturer, Mr. C. H. Fuidge, Chief Physicist of the South Eastern Gas Board, Chairman of the Technical Committee of the British Road Tar Association, a Member of the Research Committee of the Coal Tar Research Association and Chairman of two of its sub-committees, will speak on 'The By-products of Coal.'

Admission will be free and tickets may be obtained from the Secretary, The Institution of Gas Engineers, 17, Grosvenor Crescent, London, S.W.1, after December 1, 1956. Accommodation is limited to 300.

NEW BRITISH STANDARD

A NEW British Standard has been published with the aim of reducing the variety of sizes of rubber tubing at present being used in laboratories. Only metric sizes have been standardised, as a large proportion of laboratory equipment is now based on metric dimensions. The sizes provided should be adequate for most normal purposes, even where inch dimensions are used. Three thicknesses of tubing are provided for —normal wall tubing, medium wall tubing, and thick wall tubing. The term 'pressure tubing' for thick wall tubing is deprecated, as unlined rubber tubing is intended for use only at relatively low pressures.

Two sizes of analytical tubing are provided for. The tube with the smaller bore is to be made of either natural or synthetic rubber; that with the larger bore is to be made of natural rubber. The standard specifies the physical requirements of rubber bungs for laboratory use, but although endeavours were made to standardise the sizes of these bungs, it was found impracticable to do so owing to the great variety of sizes in current production.

Personal

MR. F. LITLER, Deputy Chief Technical and Planning Officer of the North Western Gas Board since vesting day, has been appointed Chief Technical and Planning Officer in succession to MR. W. HODKINSON, O.B.E., whose appointment as Deputy Chairman of the Board was recently announced. Mr. Litler, who received his early education at Sir John Deane's, Northwich, graduated at Victoria University, Manchester, in 1925, obtaining a B.Sc. (Tech.) degree in Mechanical Engineering. A four-year post graduate course followed with R. and J. Dempster, gas plant manufacturers, of Newton Heath, Manchester, and then in 1929 Mr. Litler went to Sydney, Australia. He stayed there for two years to supervise the installation and erection of a completely new type of gasholder. Back in England Mr. Litler was employed by the Keighley Corporation in connection with a major extension to their gas plant. In 1939 Mr. Litler joined the United Kingdom Gas Corporation as Constructional Engineer, being made Chief Engineer in 1945. He was associated with the planning and construction of the West Yorkshire gas grid, the preliminary work connected with new gas works at Tingley in Yorkshire, and Denton, the planning of grid systems in South Wales, and major extensions at Scarborough. Just before nationalisation Mr. Litler developed a type of gas purifier known as the tray purifier. The first of these was installed at York; others have followed at Barrow, Cowes, and Hilsea, and further sets are going in for the Coal Board on various coke oven sites. Mr. Litler is a Member of the Institution of Gas Engineers and an Associate Member of the Institution of Mechanical Engineers. He is also a member of the Court of Governors of his old college, recently reconstituted as the Manchester College of Science and Technology; a member of the Engineering Advisory Committee of the Royal Technical College at Salford; a member of the Management Committee of the Manchester and District Section of the Institution of Gas Engineers; and Chairman of the Lancashire and District Education Committee of the Institution of Gas Engineers. He is married, has one daughter, and lives at Hartford, Northwich.

MR. JOHN BAXENDALE, District Engineer and Manager of the combined Yeadon and Guiseley Districts and Calverley and Horsforth Districts of the Leeds Group of the North Eastern Gas Board for the past six years, has been appointed District Engineer and Manager for the Scarborough District. A Member of the Institution of Gas Engineers and of the Institute of Fuel, Mr. Baxendale was formerly Deputy Engineer and Manager of the Bingley gas undertaking and later Gas Distribution Engineer for Bingley and Shipley Districts. He was educated at Bingley Grammar School and was at one time Secretary of Bingley Baptist Church where his father, the late Rev. H. Baxendale, was a former minister. A former Chairman and Treasurer of Bingley Round Table, Mr. Baxendale is the present President of the Shipley Table and a founder-member of Aireborough Rotary Club.

MR. R. D. DIMOND has been appointed Senior Buyer, and MR. J. C. JENKINS, Deputy Senior Buyer of the buying and contracts department of the North Thames Gas Board. Mr. Dimond has been Manager of the Board's meter department at Pound Lane since 1947, and began his service with the former Gas Light and Coke Company 22 years ago, working in their stove and meter department. Mr. Jenkins has been a Group Buyer with the Board since 1948, dealing mainly with engineering supplies. He went to the stores department in 1947 after 12 years' service as a chemical assistant in the Board's research laboratories.

MR. W. E. CONE, Technical Adviser of the British Road Tar Association, who was due to retire on March 14, 1956, and at the request of the Council agreed to remain in office for a further year, will now continue in his present position with the Association until March, 1958.

MR. ARTHUR BURTON-STIBBON has been appointed Manager of the Solid Smokeless Fuels Federation. Mr. Burton-Stibbon, who was Regional Officer, London Region, Coal Utilisation Council, is a Registered Architect, a Chartered Municipal Engineer, a Fellow of the Institute of Arbitrators, and has the Diploma in Administration (Engineering).

MR. BRIAN C. SMITH, of Bradley Road, Huddersfield, Assistant Manager at the gasworks at Huddersfield, has been appointed District Manager and Engineer for Dewsbury and Osset in the Wakefield Group of the North Eastern Gas Board. He takes up his appointment on December 1.

MR. J. R. ARUNDALE has retired from the office of Secretary of Simon-Carves, Ltd., owing to ill-health. MR. R. S. HELLIWELL, the Company's Accountant, has been appointed Secretary in his place..

MR. GEOFFREY SIMS-DAVIES has been appointed Equipment Manager of British Oxygen Gases Ltd.

MR. R. B. LONG has been appointed Export Sales Manager by Chaseside Engineering Co., Ltd.

CORRESPONDENCE

The Consumer Comes First

DEAR SIR,

Your recent excellent leader 'Must Efficiency Breed Redundancy?' has missed an important point. How does the consumer fare by scrapping smaller works, enlarging the remaining works, and extending the distributing systems to maintain supplies?

To squeeze the last few cu.ft. from a ton of coal or oil may easily cost more than the selling price of the extra gas obtained.

All this integration business has to be paid for by the consumer and by saving wages of the redundant staff to pay interest on capital expenditure. Unless it is to the pecuniary advantage of the consumer, it is better to pay wages than pay interest on capital expenditure. The consumer comes first!

Yours faithfully,
'AN OLD HAND.'

Diary

November 15.—SOUTH EASTERN G.C.C., METROPOLITAN DISTRICT: Council Offices, 4/6, Wandsworth Road, S.W.8. 2.30 p.m.

November 15. — INCORPORATED PLANT ENGINEERS, BLACKBURN BRANCH: Golden Lion Hotel. 'Smoke Abatement (Part II),' by J. D. Lewis. 7.30 p.m.

November 15.—THE INSTITUTION OF CIVIL ENGINEERS: 'Metallic Corrosion and Conservation,' by W. H. J. Vernon.

November 20.—GAS OFFICERS' GUILD GENERAL MEETING: Committe Room 8, Church Street, Westminster, 5 p.m. Honorary members are invited.

November 20.—WALES AND MONMOUTHSHIRE JUNIORS, SOUTH WALES AREA: Monmouth. 'Notes on Implementation of a Fuel Policy in Wales, by A. Yates.

November 20-21.—AUTUMN RESEARCH MEETING. Details on p. 419.

Obituary

MR. WALTER SALE, of Chipping Norton, Oxon, has died aged 62. Mr. Sale was employed for 20 years in the gas industry and was latterly Manager of the Chipping Norton gasworks, remaining in this post when the Southern Gas Board assumed control until the closure of the works and showrooms.

MR. JOHN MCGARVA, who was employed all his life in the gas industry in Ayrshire, has died aged 63. Mr. McGarva joined the office staff of the Newton Gas Company as a boy, later becoming chief gas meter surveyor.

MR. H. SHOOSMITH, Chairman of Plenty and Son, Ltd., has died. As a result, MR. G. T. SHOOSMITH has been appointed Chairman and Managing Director, and MR. M. A. H. WALFORD Deputy Managing Director.

MR. THOMAS WATTERS, of Earl Street, Dundalk, who was a Director of Dundalk Gas Company, has died in a Dublin nursing home.

Gas Used to Heat New Electrical Laboratory

DECISION BASED ON ATTRACTIVE COST FACTOR

GAS space heating has been adopted for the new electrical testing laboratory of Pilkington Brothers Ltd., at St. Helens, Lancs., officially opened last week by Lord Citrine, of the Central Electricity Authority.

This huge new building, one of the finest in the world, is designed to provide facilities for testing of disc type toughened glass insulators. Completely insulated with fibreglass, the main building involves the provision of warmth for a limited number of employees rather than the need to maintain high temperatures throughout the entire area.

FULL CONSIDERATION

After full consideration of all the factors, and despite the fact that the new building is devoted to electrical testing, the company's advisers decided to install gas heating, because of the very attractive cost factor as against electricity.

Experience has proved that the decision is sound since the heating has proved most satisfactory in operation.

Your Schemes Are Fantasy, Planning Inquiry Is Told

BILSTON Borough Council scheme to acquire a large factory near the town centre for development as a residential area was 'fantasy,' the local planning enquiry was told recently.

Mr. W. B. Harris, for the firm—J. A. Jordan & Sons, Ltd., gas appliance enamellers—told the inquiry: 'Here we are, and we have no intention of moving.'

In the view of the company, the planning authority's suggestions were 'quite absurd.' The Government was shouting to industry to turn its wheels faster, yet the authority wielded a planning weapon which stifled works of that nature.

In his final address, Mr. Harris called complaints about alleged emission of fumes and dust from the factory plant and noise from the machines 'exaggerated and vitriolic.'

MIDLAND JUNIORS' VISIT TO WORKS

FORTY members of the Midland Junior Gas Association, with their new President, Mr. J. A. W. Stratton, visited the plant of John Summers and Sons Ltd. last month. This huge works occupies 533 acres, and has within its boundaries 76 miles of railway and 12 miles of roads. Employees number over 9,300.

Mr. Ivor Jones and three associates proved exceptionally good guides, and the visit was most interesting. Of special interest were the coke oven plant, by-products plant, sinter plant, blast furnaces, melting shop, slab mill, hot strip mill, and coke production mills.

Luncheon was provided in the works canteen, and Mr. Stretton thanked all concerned for the facilities granted and generous hospitality.

COKE SALES CIRCLE

The autumn meting of the London and Counties Coke Sales Circle was held on October 10 at the Connaught Rooms, Great Queen Street, London, W.C.2, 150 members attending—almost a record. The meeting was devoted to a talk on the principles underlying the coke marketing scheme and price structure in the South of England by Mr. W. L. Wright, Coke Manager, South Western Gas Board, supported by Mr. F. W. Freeth, Area Coke Officer, Southern Gas Board. A discussion followed.

Week-End Course for Home Service Advisers

HOME service advisers from every part of the West Midlands gathered at the West Midlands Gas Board showrooms, Leamington Spa, on November 2 for a week-end course designed to stimulate and increase their selling ability.

Members of the course were welcomed by Miss O. L. Humphries, Area Home Service Adviser, and were afterwards addressed on 'Positive Thinking' by Mr. A. L. Jackson, Governing Director of Sales Consultants Ltd., Leicester.

During the week-end, the advisers heard lectures dealing with 'How to Handle People,' 'How to Get People's Attention and Hold Their Interest,' 'Helping at Exhibitions,' and every other aspect of selling which the home service adviser is likely to meet—all given by Mr. Jackson.

New Premises

The National Council for Technological Awards now has its own premises at 9, Cavendish Square, London, W.1 (Telephone: MUSeum 1978).

NINE IDEAS WIN AWARDS

Nine suggestions put forward in the South Eastern Gas Board suggestion scheme have won cash awards this year. The Deputy Chairman of the Board, Mr. R. H. Sandford Smith, presented the prizes. Our photograph shows Mr. F. J. Anderson, a plumber at Tunbridge Wells works, explaining, by means of a model made in the Board's appliance workshops, his suggestion for a telescopic filler for road transport tankers taking concentrated liquor from the works. Mr. Sandford Smith is on the left. Others in the picture are (left to right):—Mr. E. Godbold, producer gas plant foreman, East Greenwich Works; Mr. A. E. West, shift charge hand, mechanical department, East Greenwich works; Mr. A. E. Dunstall, fitter, Portslade works; Mr. L. W. Grant, coke oven production foreman, East Greenwich works; Mr. F. J. Anderson, plumber, Tunbridge Wells works; Mr. J. Murphy, foreman gasmaker, East Greenwich C.W.G. plant; Mr. G. H. Shelley, fitter, Bromley depôt; Mr. S. C. Lowe, foreman gasmaker, East Greenwich C.W.G. plant; Mr. R. O. Holmes, benzole plant attendant, East Greenwich works; Mr. A. Sears, senior weighman, coke department, East Greenwich works; Mr. P. P. Reen, carpenter, East Greenwich works.

GAS BOARD'S HOSTEL FOR WORKERS

To help combat acute difficulties from shortage of labour, the West Midlands Gas Board sent recruiting parties to South Wales and Ireland soon after nationalisation. When men were found who were willing to work in the area no accommodation could be found for them, and a hostel was erected at Foleshill, Coventry, comprising three hutments with sleeping and washing accommodation for 60 men. Pictured above is the hostel kitchen

Work Starts on New Coke Research Centre

IN his opening speech at the seventh conference of the British Coke Research Association at Church House, Westminster, London, S.W.1, on November 7, Mr. Leslie O'Connor, C.B.E., Chairman of the Association, announced that orders have now been placed for the erection of a new coke research centre for the British Coke Research Association at Chesterfield, Derbyshire. The site for the centre has been leased from the National Coal Board and is adjacent to the Avenue coking plant officially opened by the Minister of Fuel and Power, Mr. Aubrey Jones, on October 30.

The coke research centre will comprise laboratories, offices and a full-scale test coking plant; the total cost of the scheme will be £500,000. The main contractors for the experimetnal coking plant are the Woodall-Duckham Construction Co. Ltd., who were also responsible for the new Avenue coking plant of the National Coal Board. The offices and laboratories will be built by Thomas Beighton Ltd., of Brimington, near Chesterfield, the architects being Westwood, Sons & Harrison, London.

Mr. O'Connor said that this project was the realisation of an ideal long cherished by the coking industry. It would include equipment for carbonising coal on a scale directly comparable with normal coke oven practice, and the coking industry would at last have the large scale facilities to examine problems of direct concern to the practical man in the industry. The project has the full support of the members of the Association comprising the National Coal Board, the iron and steel industry and the independent companies operating coke oven plants. In addition, the Gas Council, as an associate member of the British Coke Research Association, is also contributing towards the cost of the new coke research centre. The major coke oven constructional companies are also supporting the scheme.

The plans which are now being put in hand are the implementation of the Association's policy of centralisation of the research activities. Construction work on the site has actually commenced and the laboratories will be completed in approximately 18 months' time.

COSTLY DAMAGE

Wilful damage to street lighting installations is costing Liverpool ratepayers £4,500 a year in replacements, Alderman Hugh Carr, Chairman of the Liverpool Corporation Street Lighting Committee, said at the recent annual inspection of street lighting. Included in Liverpool's 1,000 miles of street lighting installations are 25,606 electric and 10,300 gas lamps.

Cumberland Grid Nears Completion

PROJECT DATES BACK TO PREWAR DAYS

THE last link in the Cumberland gas grid, which dates back to pre-nationalisation years, is expected to be completed about the middle of next year. With the final connection between Wigton in mid-Cumberland, and Carlisle, the grid will connect up East, and West of the county.

The story of the Cumberland gas grid, which now serves 100,000 people, began before the last war when the United Steel Company's Moss Bay steel works at Workington, West Cumberland, installed new plant which made available a large surplus of coke oven gas.

Surplus Purchased

Workington Corporation made an agreement to take the surplus and nearby Ennerdale Rural Council arranged to get its supply from Workington, the first grid main being laid from the town for that purpose. Extensions were later made to Cleator Moor, Frizington, Egremont and St. Bees, all in the West of the county.

Workington gas works ceased to carbonise coal restricting its activities to the purification of the coke oven gas for the grid network, while the small gasworks at Ennerdale, Frizington, Cleator Moor and St. Bees were closed down.

On Vesting Day

That was the position at vesting day when the former Western Group of the Gas Board, now the new Cumberland Division, proceeded to extend the grid to Whitehaven, whose gasworks were also duly closed down.

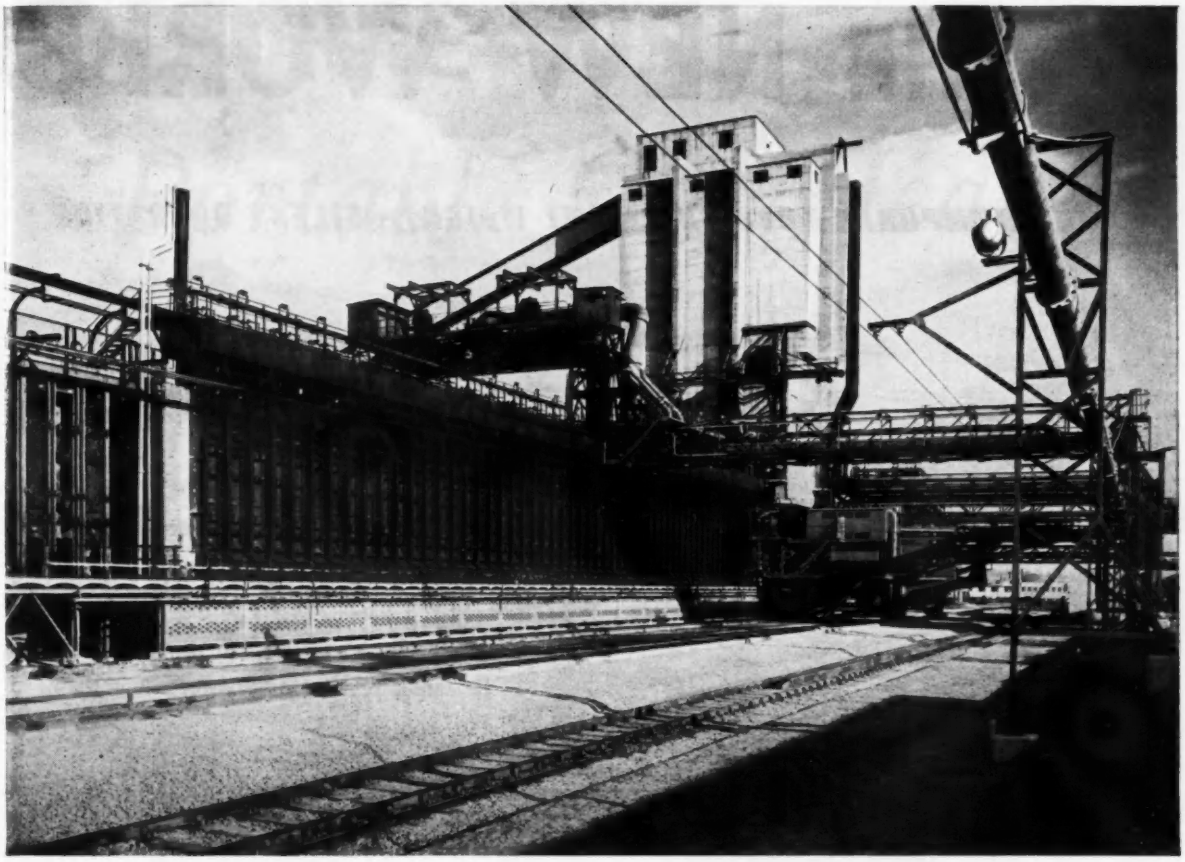
The grid was then taken North along the coast to Maryport, Allonby, and Silloth, entailing the closure of Maryport and Silloth works. Then it proceeded inland to Cockermouth and Aspatria, and more recently to Wigton, those three works also being closed.

Mutual Aid

The completion of the last link between Wigton and Carlisle, for which preparations are now being made, will mean that the Workington and Carlisle sources of supply will be able to help each other in emergency, while intermediate centres will be able to be fed from either West or East.

Model Gasworks Shown

The North Western Gas Board is exhibiting a model gasworks at Wellacre County Secondary Boys' School, Flixton, near Manchester, in one of the biggest careers exhibitions ever held at a single school.



The Pusher Side of the North Battery after six months operation

The Avenue Carbonisation and Chemical Plant of the National Coal Board, East Midlands Division

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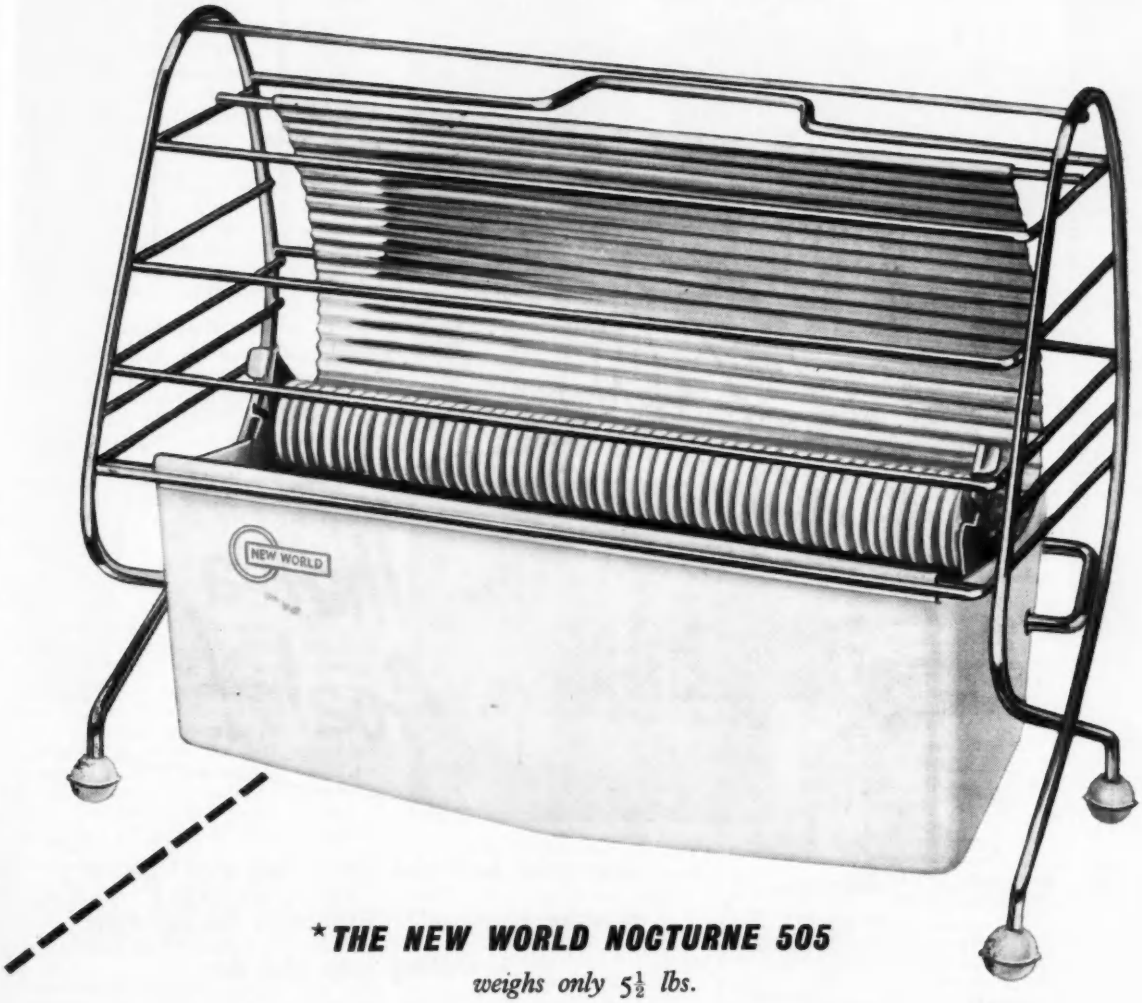

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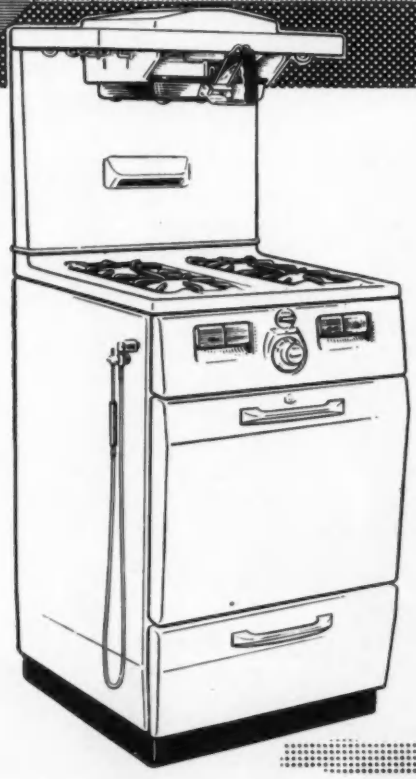

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Onlookers Cheer as New Vessel Is Launched

LATEST ADDITION TO S.E.G.B. FLEET OF COLLIERS

AMID the cheers of the onlookers the m.v. Kingston, latest addition to the South Eastern Gas Board's fleet of colliers, went down the slips at Burntisland, Scotland, last month. The naming ceremony was performed by Lady Maud, wife of the Permanent Secretary to the Minister of Fuel and Power, Sir John Maud, G.C.B., C.B.E.

The m.v. Kingston, which replaces the lost m.v. Guildford, is 275 ft. overall with 39 ft. 6 in. beam; she draws 17 ft. 1 in. She is of 2,875 tons deadweight, and her average cargo capacity in three holds is 2,800 tons.

Single Berth Cabins

All personnel will have single berth cabins with the master, officers and steward accommodated amidships.

The vessel will be propelled by a two-cycle trunk piston, direct reversing, airless injection British Polar engine, having eight cylinders each with 340 mm. bore by 570 mm. stroke and developing about 1,150 b.h.p. at 225 r.p.m. in service.

Captain E. Clarke, M.B.E., has been appointed Master of the new vessel. Captain Clarke, joined the former Wandsworth Company in September, 1934, and assumed his first permanent command in April, 1943. He possesses a foreign-going master's certificate, and was awarded the Order of the British Empire for his wartime service at sea.

Interesting equipment with which the Kingston is equipped includes Calor gas cooking facilities in midship accommodation, and a solid fuel burning range in the galley aft for main cooking requirements. She is fitted with radar, radio telephone (in addition to normal wireless telegraphy equipment to meet statutory requirements) and telephonic intercommunication between essential points in the ship.

Among those present at the launching with Lady and Sir John Maud were Mr. W. K. Hutchison, C.B.E., Chairman, South Eastern Gas Board, and Mrs. Hutchison; Mr. Sydney Smith, Chairman, Scottish Gas Board, and Mrs. Smith, Mr. R. H. Sandford Smith, Deputy Chairman, South Eastern Gas Board, and Mrs. Sandford Smith; Mr. F. C. Asgill, Vice-Chairman, Stephenson Clarke, Ltd., and Mrs. Asgill; Mr. R. M. Farror, Assistant Chief Engineer, South Eastern Gas Board, and Mrs. Farror; Mr. A. C. Costelow, Coal and Shipping Manager, South Eastern Gas Board, and Mrs. Costelow; Mr. A. E. Dean, Marine Superintendent, South Eastern Gas Board; Captain and Mrs. Clarke; Mr. J. S. Johnson, Supervising Engineer in attendance at Burntisland, and Mrs. Johnson; Sir Wilfrid Ayre, Chairman of the Burntisland Shipbuilding Co. Ltd., and Lady Ayre; Mr. Howard Johnson, Managing Director, and Mrs. Johnson, Mr. J. W. Clarke, Director; and Mr. A. H. Strand, Director.

M.v. Kingston just after her launching

At the launching (left to right): Lady Maud, who carried out the naming ceremony, Sir John Maud, G.C.B., C.B.E., Permanent Secretary, Ministry of Fuel and Power, and Mr. Howard Johnson, Managing Director, Burntisland Shipbuilding Co. Ltd.

FIRM ANNOUNCES TAKE-OVER PLAN

Lancashire Dynamo Holdings, Ltd., announce their proposal to acquire the business of J. G. Statter & Co., Ltd., of Amersham Common, Bucks, and for this purpose the directors propose to increase the capital of Lancashire Dynamo Holdings to £3,000,000 by the creation of 500,000 ordinary shares of £1 each.

The proposed acquisition will also include Minerva Mouldings, Ltd., an associated company of Statter's, who manufacture a wide range of moulded products for the electrical industry.

Col. G. S. Marston, D.S.O., M.C., who founded the Company in partnership with the late Mr. J. G. Statter, has recently completed an extensive overseas tour, including India, Australasia, and the Far East, when he visited the overseas representatives and customers both of Statter's and the Lancashire Dynamo Group.

Birthday Dinner

SCARBOROUGH branch of the Women's Gas Federation held their second birthday dinner in the Salisbury Hotel on October 26 which was attended by 84 members and friends. The Mayor and Mayoress of Scarborough, Alderman and Mrs. H. Storry, County Alderman and Mrs. R. S. Butterfield, and Mr. J. H. Race, Scarborough District Engineer and Manager, North Eastern Gas Board, were guests.

Mrs. D. M. Haigh, Chairman, spoke about the branch's achievements in the past year, and Mr. Race spoke on behalf of the N.E.G.B. The Mayor replied on behalf of the guests.

NEW ZEALAND VISIT

Mr. J. T. Haynes, of Bournemouth, is visiting New Zealand to advise electric supply authorities on the technical condition of gas undertakings which they will be expected to take over and conduct when the Gas and Electricity Co-ordination Committee Act is implemented.

Mr. Haynes has spent most of his life in association with gas production. He retired recently from the general management of the Western Division of the Southern Gas Board.

New Office Opened

Holden & Brooke, Ltd., manufacturers of centrifugal and reciprocating pumps, heat exchange plant and steam auxiliaries, have opened a branch office at 9, Broad Quay, Bristol. Telephone: Bristol 28581.

New Sulphuric Pickling Plant

SHOULD BE OF WIDE SERVICE TO INDUSTRY

General view of exterior.

RECENT developments at the Rose Mount iron works of Robert Dempster & Sons, Ltd., Elland, Yorks, include a new sulphuric phosphoric pickling and painting shop which is now in operation. With this plant the company are confident that they will be able to give wide service to many branches of the engineering industry.

The new shop has been built on a site within the existing works boundary, and is served by a ring road which facilitates receiving and despatching materials, the scheme being devised and built to meet an expanding demand for the pickling and painting of steel plates and sections used in gas, chemical, and oil plants, and general structures.

Cost of Corrosion

Corrosion of steel is costing industry enormous sums every year, spent not only in replacements, but in maintenance by regular painting and other treatment. Corrosion has its primary origin in millscale and rust which are formed in the rolling processes, and unless they are completely removed by a positive method, the acids in the atmosphere combine with moisture continuing the corrosion at varying rates according to the localities.

In the sulphuric acid/water wash/phosphoric acid process which has been installed, millscale and rust are removed from the steel by immersion in a 5-6% sulphuric bath at a temperature of 65°C. for 15 to 25 minutes, after which superfluous acid is allowed to drain off prior to washing by two dips in the water bath which is maintained at 65°C. After washing, the steel is then immersed in the phosphoric bath maintained at 85°C. and containing 2% free phosphoric with 0.3% to 0.4% iron. This final immersion produces a rust inhibiting coat of iron phosphate over the whole surface of the steel. When dry, and whilst still warm, the steel is painted with the priming coat specified, well brushed in.

The new shop is 200 ft. long by 52 ft. wide, and 35 ft. to the eaves, of rigid framed portal roof construction, with the lower portion bricked to a height of 9 ft., and that above asbestos sheeted.

Good Lighting

Large panels of perspex corrugated sheeting arranged on both sides and ends of the shop produce generous natural lighting by day, and mixed diffused electric lighting gives shadow-free illumination at night.

The three pickling baths are each 35 ft. by 5 ft. by 9 ft., the tops being 3 ft. 3 in. above the shop floor level. The shells are of reinforced concrete, lined on the inside with rubber membrane, and clad on the outside and inside with 9 in. thick acid resisting brickwork set in acid resisting cement and with bullnose capping.

Each bath is heated by four steam injectors of special design, and emptied by means of steam ejectors from a sump at the end, the spent pickling liquor flowing to the effluent plant along acid resisting gullies covered by cast iron open mesh grids.

Disposal of effluent in the Urban District presented a problem which necessitated the building of a complete neutralising and settling plant in order that the effluent discharged to the sewers would be of pH7 to pH9 and with solids not exceeding 40 parts in 100,000.

Complete extraction of fumes from the shop is achieved by large fans using 50 H.P. Fresh air is delivered across the shop toward the baths by another set of fans, this air being cool in warm weather, and warmed by steam heaters in cold weather, so serving the dual purpose of keeping ideal conditions for the personnel employed, and speedily drying the painted steel.

Economic Boiler

The steam requirements of the shop are met by an Economic boiler, rated at 5,000 lb. steam per hour, and fired by a high-low automatic flame control oil burner, the entire plant being situated in a boiler house annexe at the east end of the shop. Fuel oil for the boiler is contained in two storage tanks each of 4,000 gal. capacity, and is heated by electric immersion heater for starting up and by steam coil subsequently.

The shop is served by a 10-ton overhead electric travelling crane, of the firm's own make, augmented by two 5-ton mobile cranes at peak periods of unloading and loading. Special tackle has been designed to handle varying types of materials to be treated and special racks to facilitate painting.

The whole process is controlled from a laboratory office situated at the west end of the shop, above the main electricity switch room, and some 10 ft. above the shop floor level, from which a full view of the whole shop is obtained, and all stages of the process kept under constant supervision.

The plant is capable of dealing with flat plates or sections to a maximum of 34 ft. long by 7 ft. wide, whilst curved plates of 35 ft. by 7 ft. with a versed sine of up to 4 ft. 6 in. can be accommodated at a single dip.

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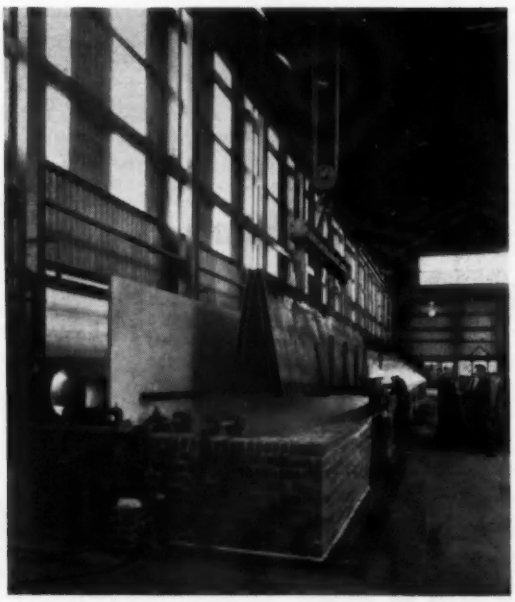


Steel plates being lowered into the sulphuric bath. After washing in water, they will be immersed in the phosphoric bath.

★

MANY NEW PRODUCTS AT OLYMPIA

Bigger-than-Ever Public Works Show Open Until End of This Week

A CONSIDERABLE number of new products are introduced at the Public Works and Municipal Services Exhibition, which was opened at Olympia, London, by the Minister of Housing and Local Government, Mr. Duncan Sandys on Monday, and which closes on November 17.

The trend in much of the contractors' equipment to be shown is towards larger and more powerful machines. Bigger dumpers, truck mixers, loaders and so on are to be found among the exhibits than were available two years ago when the exhibition was last held.

Many of the leading manufacturers, however, have concentrated on improving the design, reliability and general performance of their established models, which have already proved their value to all engaged in public works contracts.

The size and scope of the exhibition is bigger than ever. For the first time since it was inaugurated in 1919, the entire available space at Olympia is occupied by 366 stands (275 in 1954) providing a complete survey of equipment required by municipal and local government services both at home and overseas.

In conjunction with the exhibition a congress is being held at Olympia. Yesterday there was a session under the auspices of the Institution of Gas Engineers, with Sir Henry Jones, President of the Institution, in the Chair.

Papers read at this session were: 'Gas in the Production and Maintenance of Public Service Vehicles,' by Mr. T. H. Pardoe, and 'Heat Services by Coke in Municipal and School Buildings,' by Mr. C. A. Deas.

Your guide to some of the more important exhibition stands

The Horstmann Gear Co., Ltd. (stand 9), are showing gas controllers and 'Comets' for the automatic control and ignition of gas-lit street lamps. Movements incorporate either 15 or 40 day run, and solar dials automatically adjust the lighting and extinguishing times throughout the year. 'Comets' eliminate the necessity for constantly burning by-passes.

Broom & Wade, Ltd. (stand 20), are exhibiting 'Broomwade' pneumatic equipment comprising portable and stationary air compressors and pneumatic tools covering the requirements of civil engineers and public works contractors. A special feature will be the exhibit of four rotary air compressors with outputs ranging from 120 cu.ft. to 600 cu.ft. of free air per minute at 100 lb. per sq. in. pressure.

'Broomwade' type WR 120 rotary, two-stage portable air compressor, delivering 120 cu. ft. of free air per minute at 100 lb. per sq. in. pressure.

Warsop Power Tools, Ltd. (stand 22), show a new 4.-in. self-priming diaphragm pump of revolutionary design. Powered by a Lister LD diesel engine, a geared oil pump operates hydraulically a double-acting ram connected to the diaphragm, while a relief valve enables the engine to be started free of any pumping load. The maximum suction lift is 25 ft., and the maximum total head, 40 ft. The maximum free flow output is 5,000 gal. per hour.

Additional to the range of petrol and diesel driven pumps is included a new 3-in. belt driven pump and an electric motor direct-coupled 2-in. pump. Also shown are the 'Warsop' S.7 portable concrete breaker and the 'Warsop Benjo' rammer.

John Allen & Sons (Oxford) Ltd. (stand 23), show the Allen C. 16½ cu. yard crawler mounted excavator, a mobile shovel/crane. The 14/30 super-duty trenching machine and Allen offset super-duty trenching machine; the Allen power grader; and a tractor operated shovel for cutting trenches to a depth of 8 ft. 6 in. and 24 in. wide.

Thos. W. Ward, Ltd. (stand 27), are showing the 'Smith 8' excavator, which has an 8 cu.ft. bucket, and a 24 b.h.p. drive. Drag shovel, dragline or skimmer diesel engine or 20 h.p. electric motor equipments can be supplied or the machine arranged as crane or grabbing crane. Also exhibited are the Fowler 'Challenger 2' diesel crawler tractor; a Weatherill loading shovel, and a Hemel-Ward 'Rover' hoistower, single barrow type, lifting 10 cwt. at 100 ft. per minute.

The Stanton Ironworks Co., Ltd. (stand 31), are showing spun iron pipes representing their main output, together with Stanton screwed-gland flexible and Stanton bolted-gland flexible joints. More than 80,000 miles of spun iron pipes have been sold for use in water, gas or sewage mains throughout the world, say the Company.

Spun concrete pipes with Stanton-Cornelius flexible joints are also shown, as well as the Stanton prestressed concrete pressure pipe, manufactured in large diameters, which is being used increasingly for the conveyance of water under pressure. The prestressed concrete pressure pipe is relatively new to Great Britain, but it has been used extensively in the United States of America for many years.

Flexibility

Mechanical demonstrations will show the flexibility of Stanton joints for both cast iron and concrete mains, and four segments as used in the Dartford tunnel will illustrate a less well known aspect of the Stanton business.

Robert Cort & Son, Ltd. (stand 33), exhibit grading screens for the separation of coal, slurry, coke, ores, and chemicals, etc., including: The Cort-Krupp high speed resonance swing screen; the Cort 'Super-Spartan' reciprocating screening conveyor; and the Cort 'Cæsar' oscillating screen.

Chaseside Engineering Co., Ltd. (stand 43), show both of the well-known Chaseside 'Loadmaster' shovels—the '500' rear wheel drive and the '600' front wheel drive, which is designed to have exceptional manœuvrability for working in confined spaces. Various attachments for use with these machines include a rock scoop, a bulldozer blade, a crane hook and a fork lift tower for converting the shovel into a fork lift truck. Also on the stand are the 'D.3' dumper with instantaneous gravity tip, and the 'power pack' portable diesel power unit.

R. H. Neal & Co. Ltd. (stand 44), mobile crane manufacturers, are exhibiting their latest models, including their type 'QMW' (six ton capacity) fully mobile crane, and for the first time the new type 'NMS' (three ton capacity) lorry mounted model.

Their subsidiary company, Lorry Loaders Ltd., are exhibiting, on the same stand, the latest model Neal hydraulic lorry loader, and the 'Pelican' loader with hydraulic grab fitted to a Fordson Major diesel tractor.

A.C.E. Machinery, Ltd. (stand 46), include among their exhibits the new one barrow-hoisting 'Squirrel' mobile hoist, which is unsupported for 19 ft. landing. It is extensible to 60-70 ft. Other hoists are the 10 cwt. 'Comet' mobile hoist (diesel/petrol/electric) and the 5 cwt. capacity midget scaffold hoist, with attachments to facilitate its use in-

dependently of a scaffold tower. Also, there is the new 'Skymaster' passenger/goods hoist, the most up-to-date hoisting equipment for carrying construction personnel engaged above average heights, and the 1-ton capacity 'Loadmaster' side runner platform hoist.

Thomas Smith & Sons (Rodley), Ltd. (stand 55), are showing the '21' universal-type excavator with a standard bucket, capacity 3-4 cu. yards. This is mounted on crawler tracks and capable of operating as rope or chain crowd shovel, dragline, dragshovel (straight or gooseneck boom), skimmer, crane, grab crane or piledriver. The diesel engine develops 72 b.h.p. at 1,200 r.p.m. This machine is exhibited fitted with crane equipment, and will feature a new type power lowering mechanism. Also shown is the 'Super-10' universal excavator with a standard bucket capacity of 3-8 cu. yards.

The Consolidated Pneumatic Tool Co., Ltd. (stand 59), are showing the most modern range of compressed air plant and equipment for civil engineering and contracting work, including oil-flooded rotary air compressors in many capacities. These compact oil-cooled portable machines are shown as single-stage models in 40 and 70 cu.ft. capacities and two-stage models in capacities of 120, 175, 210, 365, and 600 cu.ft.

Tampers

New items of contracting equipment include the No. 4 ring valve backfill tamper, the most powerful machine, and the special version known as the 'CP' triple tamper, which incorporates three backfillers mounted as one unit. Also, there is a new heavy duty internal vibrator model 5180, for mass concrete construction. Representative examples of rock drills, breakers, picks, pumps and many types of pneumatic tools for maintenance work, and electric portable power tools and lifting jacks, are being shown.

The 'Brayloader 430.'

The Allis-Chalmers 'TL-12D.'

Entirely new tracto-loader

Mackay Industrial Equipment, Ltd. (stand 67), feature the Allis-Chalmers 'TL-12D'—an entirely new tracto-loader powered by an Allis-Chalmers 6-cylinder diesel engine developing 70 b.h.p. It has a four-wheel drive with hydraulic torque converter and clutch-type transmission, and a forward discharge height of 1 cu. yd. bucket 9 ft.

Also there is the Allis-Chalmers 'HD11G,' a powerful tracto-shovel, hydraulically operated, and the new Allis-Chalmers 'HD6G' with a two-position bucket, capacity 1½ cu. yd., discharge height 9 ft. The 65 b.h.p. 4-cylinder diesel engine produces a drawbar pull of 12,650 lb.

The Fiat 60C Crawler Tractor is also shown. This is a recent development of model 55LI. 60 b.h.p. 4-cylinder four-stroke diesel power unit will give an even greater drawbar pull. The most outstanding development is a 9-speed (4 reverse) gear box.

Exhibited is a Fiat 4-cylinder four-stroke diesel engine producing 25 b.h.p., with a maximum drawbar pull of 4,500 lb.

Other exhibits are the Merton overloader, the Merton two-way loader, and the new Mackay direct air compressor, model 'DAC 130,' which is based on the free piston engine principle.

The first British-built, 4-wheel drive loading shovels have been manufactured by **W. E. Bray & Co. Ltd.** (stand 72), and one of these—the 'Brayloader 430'—is exhibited. It is a front-end shovel with a standard 1 cu. yd. capacity bucket and a safe working load of 25 cwt. Allied to the increased tractive effort of this power crowd shovel are all the standard Bray features, including ease of operation, operator comfort and all-round vision, a wide range of available attachments and complete stability.

Also to be seen is the 'Brayloader 30,' a front-end shovel with a 1 cu. yd. bucket and a safe working load of 25 cwt. The BL.30 carries the same type of Ford diesel engine (developing 42 b.h.p. at 1,750 r.p.m.) that powers the complete range of Bray shovels.

Reducing Costs

Also exhibited is the 'Hydraloader 20,' another Bray front-end shovel which has been recently introduced to play an important part in reducing bulk-handling costs. And the 'Brayloader 25' is a fully tracked shovel employing a 1 cu. yd. bucket with a safe working load of 3,000 lb.

Distinctive Appearance

Finally, there is the 'Dualoader 35,' a front-end and overhead shovel with a standard ¾ cu. yd. bucket and a safe working load of 1 ton. As with the Brayloader, the use of polyester resine reinforced with fibreglass in the manufacture of the cab and cowling has enabled a distinctive appearance to be allied with maximum efficiency.

Newton Chambers & Co., Ltd. (stand 75), are showing a truck-mounted development of the 'N.C.K. 304' which is a further addition to their very successful range of crawler type N.C.K. excavators and cranes. The machine being shown will be equipped as a dragshovel but a full range of attachments can be fitted, thus providing an extremely versatile and economical machine for those jobs where mobility is an important factor. The N.C.K. 205 is also being supplied on a truck chassis and full details of this, as well as of the crawler mounted machines in the N.C.K. range,

will be available to visitors to the stand.

Marshall, Sons & Co., Ltd., and **John Fowler & Co. (Leeds), Ltd.** (stand 77), are exhibiting two 'Track-Marshall' diesel crawler tractors with industrial equipment; a Marshall 'M.P.6' wheeled tractor with industrial equipment; 'Road-Marshall' diesel rollers; and Fowler diesel crawler tractors: 'Challenger 2,' with hydraulic angledozer; 'Challenger 3,' with angledozer and C.C.U.; and 'Challenger 4,' with angledozer.

The Rawlplug Co., Ltd. (stand 93), show fibre wall plugs for making strong screw fixings in masonry, for all screw sizes from No. 3 ($\frac{1}{4}$ in.) to No. 30 (1 in.). Also exhibited are 'Rawltools' for making the correct size holes for Rawlplug fixing devices, and 'Rawlbolts,' metal expansion bolts for heavy duty fixing without grouting. Plant can be put into operation immediately after fixing. Sizes are from $\frac{3}{16}$ in. to 1 in. diameter in various lengths. Other heavy duty fixings such as bolt anchors for caulking in, cement-in-sockets for grouting in and 'Rawltamps' for shallow concrete, are also shown.

Finally there are metal screw fixings, cavity fixings, durium masonry drills, and the Rawlplug drill hammer. Demonstrations will be given on the stand.

The Victaulic Co., Ltd. (stand 103), have a display of flexible pipe joints, including Viking Johnson couplings, flange adapters, junior couplings and 'Victaulic' joints. Sizes range from $\frac{1}{2}$ in. to 100 in. diameter for pipes of steel, cast iron concrete or plastic, for water, gas, oil, pulverised fuel, and a range of chemical and various slurries, etc.

There is also a display of accessories for completing bitumen protection and for obtaining electrical conductivity for cathodic protection.

E. Pass & Co., Ltd. (stand 127), have on their stand machines and equipment for carrying out under-pressure connections to trunk and service gas and water mains and oil pipelines, including: A main drilling machine with connection and valve for under-pressure branch connections; drilling and tapping machines for service connections under pressure; ferrules, plug cocks, nipple inserting and other ancillary equipment; lightweight and standard pipe cutting machines for steel and C.I. pipes, both for hand or power drive; and turning and cutting machines for asbestos cement pressure pipes and saddle pieces for these pipes.

Also shown are leadless split collars, mechanical type gland collars, steel repair clamps, leak clamps, etc., for emergency repairs to mains; and tapped collars for dry mains.

Of special interest are fittings for polythene tubing (for cold water), such as adaptors, connectors, under-pressure ferrules, tees, etc., with suitable joints including 'Lancaster' joint for heavy gauge and 'S.P.' for normal gauge tubing, and a hydraulic thrust boring machine, with power-operated hydraulic pump, for laying pipes across carriageways, embankments, etc., showing method of use.

Among the products shown by **Clay Cross (Iron & Foundries), Ltd.** (stand 135), are spun iron pipes, 3 in. up to 18 in. and from 100 mm. to 400 mm. diameters, 'Clay Cross' bolted and set screw type flexible joints, and concrete-lined pipe for use in transmitting water of an aggressive nature.

The Company have recently put on the market 'C.X.C.' polythene tubing in the range $\frac{1}{4}$ in. to 2 in. diameters to B.S.S. 1972, and examples are shown.

Another interesting exhibit is the 'Astell-Watts' trench excavator which can dig a trench up to 4 ft. 3 in. deep by 20 in. wide. This is ideal for laying land drains, cable and small diameter gas and water mains. It can be quickly fitted to any of the popular makes of tractor and as easily uncoupled, consequently the standard tractor can be used for other purposes when not required for the excavator.

George Cohen Sons & Co., Ltd. (stand 148) claim to operate the country's largest hire fleet of contractors' plant. At the same time, the Company offers for sale to public works contractors the country's 'greatest range' of reconditioned and new plant, as well as tools, protective clothing and miscellaneous equipment. Thus, the Company's display emphasises the range of its activities.

On show from the range of machines which can be offered for hire (or for sale) are:

(1) The Jones 'KL 66' diesel-driven mobile crane, fitted with 50-ft. sectional lattice jib and mounted on pneumatic tyred chassis. The range of applications of this machine cover the erection of steel or pre-cast concrete structures, sand and gravel grabbing, pipe-laying and general unloading and handling duties on site.

(2) The Bray 'Dualoader' model 'DL 35,' fitted with a $\frac{1}{4}$ cu. yd. bucket which can carry out both forward and rearward loading duties without adjustment.

(3) The Broom & Wade two-tool diesel-driven portable compressor mounted on four pneumatic tyred wheels with towing chassis and draw-bar; powered by a Lister diesel engine; complete with road-breaking tools.

In addition to these major exhibits, scores of examples of the wide range of tools and other equipment which the Company can provide are on show.

The Staveley Iron & Chemical Co., Ltd. (stand 151), makers of cast iron pipes for gas, water and sewage services, have samples of metal spun and sand spun pipes (centrifugally cast) which are made in diameters ranging from $2\frac{1}{2}$ in. to 7 in. and 8 in. to 24 in. respectively.

Since the last Public Works Exhibition, spun iron pipes with screwed-on flanges have been introduced, and such a pipe is displayed, together with a sectioned-out joint.

A sample of a bitumen sheathed pipe for use in particularly aggressive soils is shown. There is a representative selection of socket and spigot special castings and flanged fittings, and the bolt type flexible joint displayed is a large one, 36 in. diameter. Cut-away sections of other Staveley joints—run lead, screw-gland flexible, and Baxter pre-cast lead is displayed.

A feature of the stand is again the flexible joint demonstration machine, on this occasion fitted with Staveley screw-gland flexible joints, showing joints deflected to 4° from the centre line while subject to an internal air pressure.

Stewarts & Lloyds Ltd. (stand 153), the steel tube manufacturers, feature this year a display of various pipe protections. Particular attention is drawn to a 25 ft. length of 36-in. lined and sheathed pipe which is displayed adjacent to a 9 ft. length of the same diameter pipe. The latter, for half its length, has been externally protected with an asbestos-bitumen sheathing additionally reinforced by a spiral wrapping of woven glass cloth applied under tension. This combined protection, devised by Stewarts & Lloyds, has considerably enhanced resistance to mechanical damage and is particularly suitable for unusually severe conditions where standard sheathing is not considered to be sufficiently tough.

Another special exhibit is that of a large street-scene model designed to portray the practical application of the Company's tubes as used by public utilities for a variety of purposes. The roadway is in section and shows—in actual size—steel water, gas and sewage mains together with a selection of joints and appropriate protections.

Elsewhere on the stand, photographs illustrate domestic, municipal and industrial uses of gas and water, and there are showcases of examples of service pipes, joints and fittings.

C. H. Johnson (Machinery), Ltd. (stand 159), show two dumpers, the 'One/Thirty-five,' model 1F, 1 yd., and the 'Twin/Fifty-five' model 3E, $1\frac{1}{2}$ yd. Also displayed are concrete vibrators, power rammers, a diaphragm-type pump, a tamping and screed board vibrator, a ground consolidating vibrator, and centrifugal pumps.

Abbott, Birks & Co., Ltd. (stand 171), display equipment for pipe fitting, main-laying and pipe line maintenance, including a new power drive for a pipe drilling and tapping machine enabling mains to be drilled and tapped any size up to 2 in. B.S.P. in 90 seconds on any site where compressed air is available; cup cutters, made from a high impact steel to obviate breakage under overload; 'CP' leak clamps for lead joints of mains up to 48 in. diameter; and a new design of leadless split collar.

Also there is leak detection apparatus for gas and water leaks from pipes buried or on the surface; mains and drains testing equipment including end stoppers, testing pumps and gauges; a new portable miniature pressure gauge for household taps; and flexible metallic tubing for temporary main bye-passes during repairs, and other high pressure and temperature uses.

Thomas De La Rue & Co., Ltd. (stand 178), show 'De La Rue' thermoplastic pipes, which offer one answer to many corrosion problems. Each of several

different materials is shown and the special uses of each explained. Diameters range from capillary tubes of a few millimetres, extruded to exacting tolerances for engineering purposes, to large bore pipes of 9 in. or more.

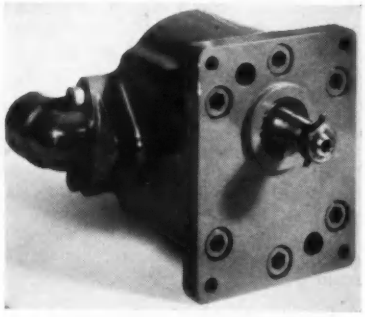
Polythene, plasticised and unplasticised P.V.C. and cellulose acetate butyrate are included in the range of De La Rue plastic pipes. Except where pipes are required to withstand prolonged high pressures and high temperatures, extruded plastics are said to offer great advantages over traditional materials.

Metalock (Britain), Ltd. (stand 188), display castings repaired by the Metalock cold repair system of inserting special alloy keys transverse to fractures, and photographic reproductions of many successful repairs carried out.

There will also be a showing on the stand of the sound film, 'Repairs by Metalock.'

For **Keelavite Rotary Pumps & Motors Ltd.** (stand 208), the central exhibit is a dual demonstration featuring a constant torque variable speed hydraulic rotary drive and synchronising the movement of unbalanced linear loads. The complete exhibit is assembled from the Company's range of standard hydraulic power transmission equipment.

Also on view is a new range of gear pumps designed specifically for earth moving and mechanical handling



The new Keelavite gear pump introduced especially for mobile applications on earth moving and mechanical handling machinery.

machinery. There are only four main components; front and rear bearing housings and driving and driven shafts. Gears are integral with the shafts. There is a choice of three alternative driving positions, a variety of porting arrangements and clockwise or anti-clockwise rotation. Displacements are 4, 5, 7, and 9 g.p.m. per 1,000 r.p.m. respectively. Peak speed rating is 3,000 r.p.m. and maximum pressure 2,000 per sq. in.

A selection from the recently introduced Keelavite range of variable delivery pump/motor units is also shown. These units cater for flow requirements up to 100 g.p.m.; the variable displacement can be controlled by either mechanical or servo arrangement.

Representative units from the Company's established range of pumps and motors, cylinders and pressure and flow control valves complete their exhibit.

Winn & Coales Ltd. (stand 242), show the new 'Denso' tape and paste, incorporating tannins. This is the first instance of tannins being used on a commercial scale as a corrosion inhibitor for suppressing bacterial activity. It is used for the protection of pipelines, cables, couplings, pipe-joints, structural steelwork and all other metalwork below and above ground and under water.

Also shown is the range of other 'Denso' anti-corrosion products, which cover almost every conceivable aspect of corrosion. Included is 'Densopol' tape, a glass fibre and P.V.C. laminated tape, 'Denglas' tape, similar to 'Denso' tape but with woven glass carrier in place of cotton.

Two new additions to the range are: (i) Sylglas glazing and sealing tape and cord, a permanent means of glazing roofs or repairing leaking roofs, whether glazed or otherwise, and (ii) new corrisol, a revised formulation of this company's corrisol bituminous lacquer, which can be applied to wet surfaces.

As in former years the **British Road Tar Association's** stand (No. 235) will take the form of an information bureau with technical representatives in attendance to give advice on all aspects of the construction and maintenance of roads with tar. The telephone number of the stand is FULham 8572.

Visitors will have the opportunity of inspecting a number of samples of different types of tarred materials cut from roads in various parts of the country, including dense tar surfacing, which is becoming increasingly popular. Accompanying the samples will be a number of photographs illustrating the roads on which the materials were laid.

The Department of Scientific and Industrial Research (stand 257), demonstrate some of the work being done to place the design of underground pipes on a more scientific basis. Its objective is closer correlation of the strength of a pipe with the load it has to carry than is indicated by current regulations and codes. Attention is also drawn to some common causes of failure arising from practical misconceptions.

The work of the Road Research Laboratory, is shown, particularly regarding wet weather damage to bituminous surfacings, quality control methods, and development of research techniques.

William Press & Son, Ltd. (stand 276), feature gas and water main laying, industrial pipework, and pipe fabrication. On the same stand, the **General Descaling Co., Ltd., Metal and Pipeline Endurance, Ltd.,** and **C. H. Kempton & Co., Ltd.** (all in association with William Press), also exhibit.

Griflex Products, Ltd. (stand 291), show P.V.C. flexible pipes, fuel pipes, and plastic hose.

Simon Engineering (Midlands) Ltd. (stand 300), show the 'Simon' hydraulic platform, model I.G.40. This machine, which is displayed outside, is mounted on a five-ton lorry chassis and is applicable to a wide range of industries.

The Simon hydraulic platform model J.30 is a smaller edition of the above, mounted on an electric truck. Its main use is for cleaning and servicing inside buildings and for lighter types of work than the larger model. It can also be supplied lorry or trailer mounted.

Former Scottish Gas Board Man Dies in Australia

MR. JOHN WATSON (formerly of Dundee), gas manager of Melbourne, Australia, and his wife, have been killed in a level-crossing accident at Frankston, Melbourne. Their two children, Ian (5) and Anne (4) are in hospital the boy's condition is critical.

The car in which the family were travelling collided with an electric train. Another couple, Mr. and Mrs. Edward Kehoe, were also killed.

Mr. Watson was aged 36, his wife 29; they had been married for six and a half years. He was educated at Morgan Academy, Dundee, and worked with the Scottish Gas Board in Dundee. Last year he left Dundee and was appointed to Stockport gasworks. In January he and his family went to Australia where he was Manager of the gasworks at Box Hill, a suburb of Melbourne.

His father and brother live in Dundee, of which Mrs. Watson was also a native.

Sir John Cass College

FULL-TIME courses on Radioisotopes and their uses are to begin on January 14, 1957, at the Sir John Cass College, Aldgate, E.C.3.

These courses, each of four weeks' duration, will open with introductory lectures on nuclear physics, radiochemistry, detection and screening of radiation, and principles of electronics as required for use of measuring instruments.

All practical work will be preceded by a short explanatory lecture and the techniques practised will include Geiger-Müller counting for solid and liquid samples, scintillation counting, gas counting, proportional counting, gamma ray spectrometry, radiography and autoradiography, specialised techniques for handling of active materials in tracer quantities, radiochemical laboratory organisation and discipline, screening and health physics measurements.

Holder Collapses

Part of the 80-year-old reserve holder of the Dungannon (Co. Tyrone) Gas Company collapsed last week.

From a Paper to the Institution of Gas Engineers, London and Southern Section, October 30.

Some Thoughts on the Coke Symposium from the Distribution Side

By D. G. ROSE, B.Sc.Econ., F.S.S., M.Inst.Gas E., M.Inst.F.
COKE MANAGER, NORTH THAMES GAS BOARD.

THOSE of us on the commercial side of coke were encouraged by the Coke Symposium and some papers which have followed it. These papers have not only shown very clearly that supplies can be stepped up considerably even from existing plant, but they also set out equally clearly the sort of coal/coke price relationship and some other essential conditions which must prevail if on the production side the development is to be economically successful. This was very timely because, in connection with Clean Air, we have heard so much about supplies at the 'right' price.

The main object of this contribution is to extend discussion to the distribution and marketing aspects of an increased sale of coke for domestic space heating, in particular the impact of its two main characteristics, poor load factor and the small amounts in which it is ordered. To distributors, it has also been encouraging to see an alternative approach made to the elusive problem of the assessment of coke quality through the interpretation of consumer complaints and in the employment of an open fire test, and it is right that in this work we should get as close as possible to the conditions under which the coke will be used for ultimately it is the customer's judgment of the product that really counts. Routine testing of composite samples at the factory is indispensable as an aid to plant control, but the fact remains that the customer, and therefore his supplier, are primarily concerned with particular deliveries rather than with averages. It is cold comfort, therefore, to the customer to be told that tests show that on average the product is of such a high standard that the odds against getting another delivery like the one he is complaining about are 30 to 1.

It may be that further work on these lines and closer attention to the increments in our samples will reveal that in coke as tested and in coke as delivered we have in fact two different commodities and lead us to adjust some of our notions accordingly. As it obviously applies with greater force to small deliveries than large ones this aspect is likely to become increasingly important as time goes on. In any case, it is time more was known about what can and does happen to coke in the operations which normally intervene between loading point and the appliance to which it is fed.

'The Verbal Average'

It is not only in our arithmetic that we overdo the average. In popular discussion on coke we are very prone to employ the verbal average and generalise where we should be more particular. Our industry produces gas and its joint product of carbonisation, coke, from a range of raw materials and in plant of different types, but whereas gas, from the point of view of consumers, is homogeneous (industrial gas is the same as domestic gas) we do, in fact, sell under the generic term 'coke' fuels which exhibit a wide range of characteristics and we frequently and understandably confuse type with quality. The aim of distributors at any time should be to see that so far as possible the various types of cokes produced go to the appliances for which they are best suited. In this connection and in the transition to a bigger proportion of domestic trade much can be and indeed is being done within the gas industry by using more of the essentially industrial types of coke in producers and water gas generators, when it can usefully release domestic types for sale. Even if this entails some additional inter-works transfers, such movements will be small in magnitude but of considerable benefit in relation to the trade as a whole.

Perhaps coke is a more complex subject than is generally supposed and especially so in regard to distribution and marketing, which sometimes appear to be taken for granted. Possibly it is because so little factual information about it is available beyond totals and averages that difficulties and dissatisfactions are so often attributed to shortcomings on the part of gas board or merchant. More likely, perhaps, their sins are no more than those of commercially-minded people tackling their problems not very differently from what the critics themselves might do, after suitable experience, if they changed places.

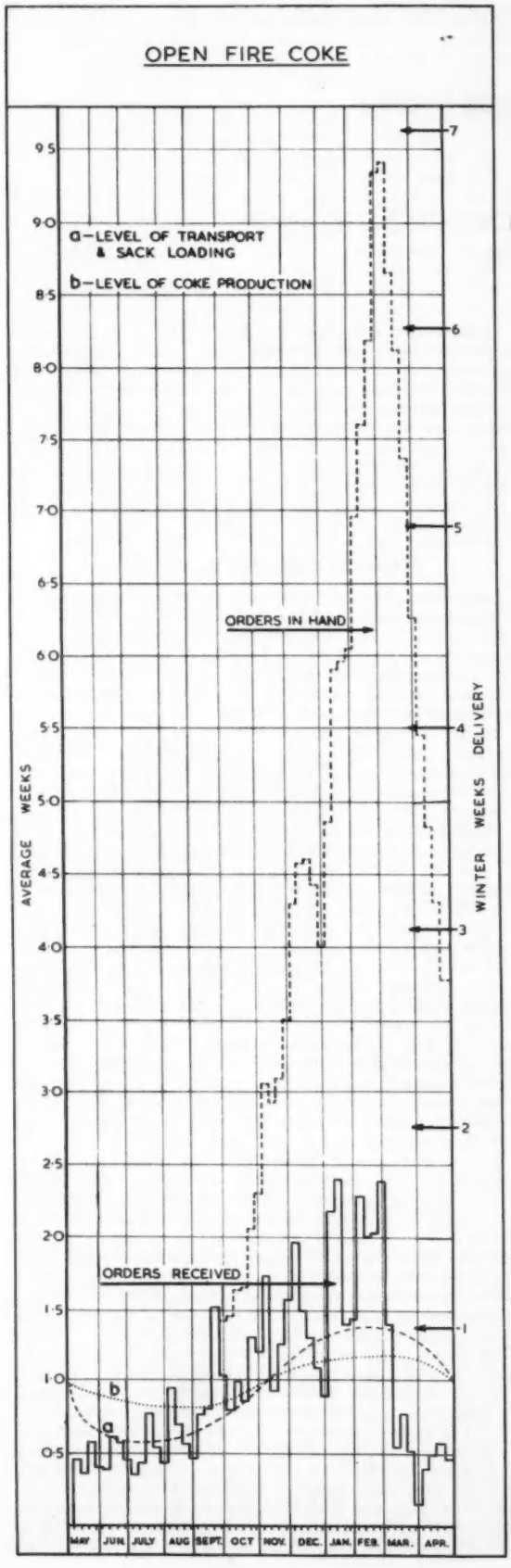
Domestic Space Heating Demand

Most markets are far from static and coke is no exception. Profound changes have taken place before in the pattern of coke disposal. Until the '20s very little coke was used for domestic purposes of any kind and then came the small hot water boiler. But this, as will be shown later, was akin in many ways to the existing trade and it was therefore accommodated without any great difficulty. Although they may all be delivering coke in sacks and using lorries of similar capacity, no two undertakings in this trade are identical. Generally speaking, they are all concerned with 'mixed' business, so it is not easy to observe one type or section of the trade in isolation.

The coke trade in the wider London area is conducted on credit terms and orders are not accepted for less than 5 cwt. The bulk of the tonnage, but a minority of customers, are in what will be described as the 'commercial' category, that is, coke supplied under contract for which the qualifying minimum requirement is 10 tons per annum. The remainder are described as 'domestic.' The average commercial delivery is about 60 cwt. and the average domestic delivery about 7 cwt., although very few orders are for precisely these amounts. The domestic average size has tended to fall over the past few years. Commercial deliveries are mainly in large coke. Domestic customers are requested to specify 'open fire coke' when ordering. They are then supplied with a selected broken coke. As domestic sales, of ¾ in. to 1¼ in. coke, are almost exclusively for the small hot water boiler the statistics for open fire coke and boiler nuts serve to describe the two main domestic uses.

The correlation with atmospheric temperature is just as certain but by no means so precise as with gas. The weather operates on coke demand, but it may be cushioned or boosted by the state of consumers' stocks of coke and other fuels, as well as by the public's own assessment of the prevailing fuel situation. Quite the heaviest spate of ordering in recent years was the sudden demand which came within hours of a radio announcement that coke was scarce and would the public please use restraint in ordering. All inhibitions of the coke-using public disappear when they are cold or frightened.

The weekly totals of orders received over the year ending March 31, 1956, reveal some significant differences in pattern between 'commercial' boiler nuts and open fire coke demand. As 'commercial' represents the bulk of the tonnage this is the dominating pattern, but open fire coke shows up immediately by its more erratic behaviour. The demand for boiler nuts is intermediate but closer to the pattern of 'commercial' than open fire coke. The peak of 'commercial' orders is in mid-June and is explained by receipt of one big stocking order for delivery over an extended period; an opportunity for levelling transport operations that helps, but is not met with in the



domestic trade. The difference between the level of transport and sack loading capacity employed, and the level of coke production, each similarly expressed in terms of average weeks, is reflected in variations in stocks of coke at gasworks.

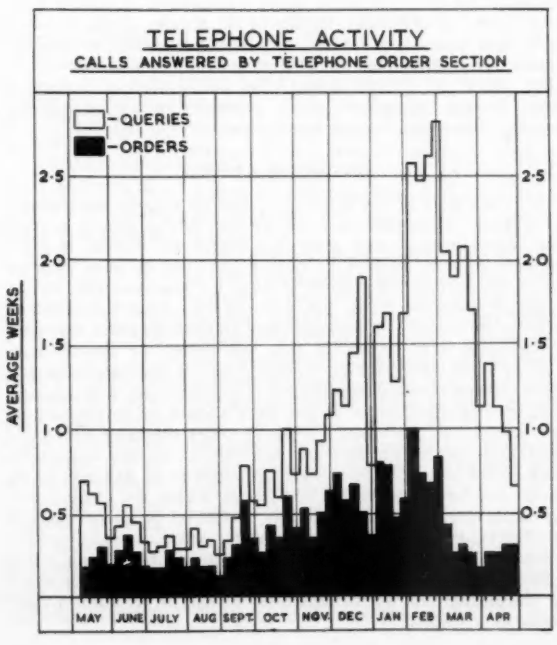
The peculiarities of open fire coke demand will come as no surprise to distributors accustomed to handling domestic coal supplies and possibly explain why summer prices in coal have been confined to housecoal grades. Dividing the 52 weeks in each case into lowest and highest six months, the winter/summer demand ratios are: Commercial 1.7, nuts 1.9, open fire coke 2.8. As the typical transport and loading ratio is roughly 2 to 1, this illustrates the impossibility of avoiding delivery delays in winter, which together with the growing proportion of domestic space heating, is an added reason why the delivery problem is more acute now than it was before the war.

From the point of view of customer relations it is very important that there should be an understanding of the office and showroom side of the problem. Figure 1 (typical transport and loading performance curve line 'a') shows the orders in hand awaiting delivery accumulating to the equivalent of seven winter weeks' deliveries. If the situation does not get quite so bad as shown, it is due to the extent to which it can be offset and the load carried by other branches of the trade. In fact, it is usually possible by various means to hold the position until Christmas; but this chart possibly explains as clearly as can be just how the situation is apt to become acute in the new year, as has happened several times in recent years simply because it is physically impossible to cope with the spate of orders when the weather becomes really cold. A similar operation on the 'commercial' data will show, again with the typical loading and transport curve, that the accumulation in this case is less than two winter weeks' deliveries.

It is sometimes said in these circumstances that deliveries have broken down when in fact loading and transport are at peak activity, so that at times of difficulty the unfulfilled consumer demand over the trade as a whole is usually quite small in relation to annual tonnage and is often more than covered by stocks at works. Merely a few per cent. either way represents the balance between alternating conditions of apparent glut and shortage which puzzle the public so much.

Something of life in the order office or showrooms at peak periods is revealed in the chart (Figure 2) of calls (orders and inquiries) received by the telephone order section, again in terms of the average week. Note how the inquiries, which

Fig. 1 left, and Fig. 2.



arise from the orders in hand, predominate and persist well after the rate of ordering has slumped. It will be appreciated that these weekly figures, impressive though they are in themselves, relate only to calls which get through to the telephone order section, and conceal the real impact, since calls taken by other staff have not been recorded.

Why is there this conspicuous difference between the characteristics of the open fire coke demand and other sections of the trade? It would appear there are two main reasons: It is essentially seasonal and very restricted storage capacity only is available for the typical open fire installation. When a consumer goes over to coke from coal the effective storage is in fact halved, deliveries are required so much more frequently and orders are similarly multiplied. We are sometimes told quiet seriously that the remedy is in a big extension of trolley services or in stepping up the facilities for the sale of coke in 28 lb. lots at works to meet emergencies. The only satisfactory solution is more storage accommodation wherever possible in domestic premises, kept filled by fewer but larger deliveries.

Comparative Costs of Distribution

The cost of serving domestic customers is considerably higher than commercial customers, due mainly to the much smaller quantities taken at a time. This difference has some reflection in prices and margins, but accurate assessment and apportionment of costs in this connection appear to be a difficult matter. For the want of something better, resort is made to broad averages. But a more detailed analysis is necessary.

The incidence of the office costs is fairly straightforward. The greater part of them represents the work entailed in recording orders, preparing tickets, checking, invoicing, etc., and is much the same whatever the quantity required, which means to say that these costs per ton vary intensely with size of order. Graphically it can be represented by the rectangular hyperbola or in simple language it costs twice as much *per ton* to handle ten cwt. orders and four times as much for five cwt. orders as it does for one ton orders. Transport costs are much more complex, but we have long felt that similar consideration must apply in some measure to them as well. So it was decided a few years ago to make a detailed study of the effects of measureable factors such as number of deliveries, mileage, loading time and delivery time.

Accordingly such data was analysed relating to 2,844 five ton loads comprising 17,887 winter deliveries ranging from two cwt. to five tons, all in sacks of one cwt. capacity. For each load the following were recorded: Loading time, including waiting time inside works; delivery time, including waiting time, if any, outside works; number of orders in the load; and mileage.

The effect of these on the number of loads per lorry per day was studied. On sack work in London five-tonners average between two and three trips per working day. Since individual lorries make a whole number of trips, those things which facilitate or prevent a third load are vitally important.

Loading time and Delivery time

There is no separate record of time, if any, spent waiting to enter the works. This is of necessity included for our purpose in delivery time. Time of entry and departure are stamped on cards by clock recorders and for the five-ton loads considered the average time in the works was 62.5 minutes. (Over a longer period the average for all 5-ton lorries is 50 minutes.) For this purpose a bigger sample was available, 4,064 loads.

	Number of Loads	Average Time
4 loads in day	180	50.8
3 loads in day	2,895	60.1
2 loads in day	982	71.7
1 load in day	7	70.3
	4,064	62.5

This table suggests that the number of loads per day is associated to some extent with loading time. Although the difference of approximately ten minutes in average loading time between four and three, and between three and two loads is not very big in itself, some loads will have taken so long as to affect the day's work of the lorry.

Delivery time is made up of three main components; (a) the time to off-load under average conditions the sacks carried plus incidental waiting time outside the works, including meal breaks, (b) the travelling time of vehicle, and (c) time taken in contacting customers and obtaining receipts.

The first item contains a number of variables but within limits may be regarded as a constant, whereas the other two items are proportionate to the miles travelled and number of drops made. That is to say, for item (b) if the miles travelled are doubled, the time taken on this account will be doubled. Similarly, for item (c) the time taken will be approximately doubled if the number of calls is doubled.

Thus the relationship between time to deliver the load (T), the miles travelled to deliver the load and return to works (X) and the number of orders in the load (Y) can be expressed as,

$$T = a + bX + cY$$

where a, b and c are constants.

By the method of multiple regression analysis the equation that best fits the 2,844 journeys is;

$$T = 79.1 + 2.78X + 4.82Y \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

This implies that about 80 minutes are spent on the average in unloading 100 sacks, meal breaks, waiting time in traffic and outside works, etc., that the average speed of the lorry on its journey is a little over 21 m.p.h. and that about five minutes are spent at each call in contacting the customer, obtaining signature and sweeping up.

In the same manner the linear relationship which best fits the data was found for the association between the number of orders in the load and miles covered for that load;

$$X = 9.4 + 0.82Y \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

or miles travelled = 9.4 plus 0.82 per call. The accepted statistical tests for equations of this nature were applied and confirmed their validity.

The average time and mileage associated with each size of order can be calculated from these two equations. From the selection of values given in the table below it can be seen how the small deliveries add to time and mileage with our pattern of trade. Again it must be stressed that no two businesses are exactly alike. Since some of their coke is received by rail and handled through numerous depôts it is possible, generally speaking, that merchant distributors work within a somewhat narrower radius.

Average Size of Order in cwts.	Mileage for one 5-ton load	Time for delivering load in minutes
5	25.8	247
10	17.6	176
20	13.5	141
50	11.0	119
100	10.2	112

The statistical equations summarise the 2,844 loads considered, and show the times taken and mileage run, on average, when delivering loads made up of orders of any given size. The make-up of transport costs is complex but it happens that they also depend on time and mileage as well as directly on tonnage. They can be divided into:

(1) Fixed costs. Part maintenance, clothing, licences and insurance, depreciation and overheads which can be worked out as so much per lorry per day irrespective of the work done, and therefore cheaper per ton the greater the tonnage.

(2) Variable costs; (a) depending on tonnage, (b) depending on time, (c) depending on mileage.

Wages may be governed by time and/or tonnage. Mileage affects such items as the cost of fuel, lubricants, tyres and part maintenance.

From actual examples under 'domestic' and 'commercial' headings, it is clear that at a seven cwt. delivery per load the point is passed at which a third load per lorry per day becomes impracticable.

The relevant information is now available for assessing the cost of the day's work and reducing it to so much per ton. It can be worked out in similar fashion throughout the range up to five tons. To illustrate the principle, this has been expressed on a relative scale in Figure 3 taking the one ton order as 100. Apart from being the unit of measurement of costs and prices, one ton is also about the average for deliveries made in sacks over the trade as a whole in this area at the present time. Reading from this chart the costs taper down

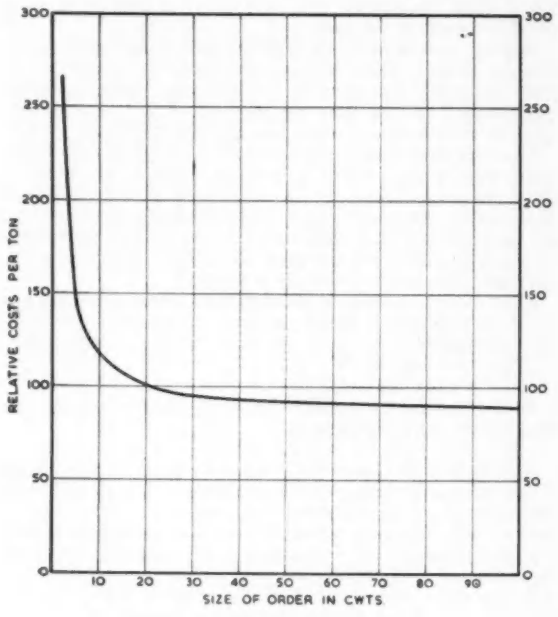


Fig. 3. Transport costs.

to 90% for five ton deliveries, but rise steeply and progressively for deliveries of less than one ton. At ten cwt. they have risen to about 120% and at five cwt. to 150% and so on. In Figure 4 the office and transport costs have been combined on a similar relative scale. It may fairly be argued that the ratio between office and transport costs vary considerably from one business to another. Two lines have been drawn. One shows transport to office, taken on the basis of 4 to 1 at the one ton level and the other at 7 to 1, but it will be clear that there is very little difference in the general relationship.

For deliveries of less than five cwt. the credit basis of trading is extravagant; economies can be effected at this point by employing the other practices already mentioned. The general method outlined can, however, be employed to establish a fair cost relationship for cash with order or C.O.D. sale.

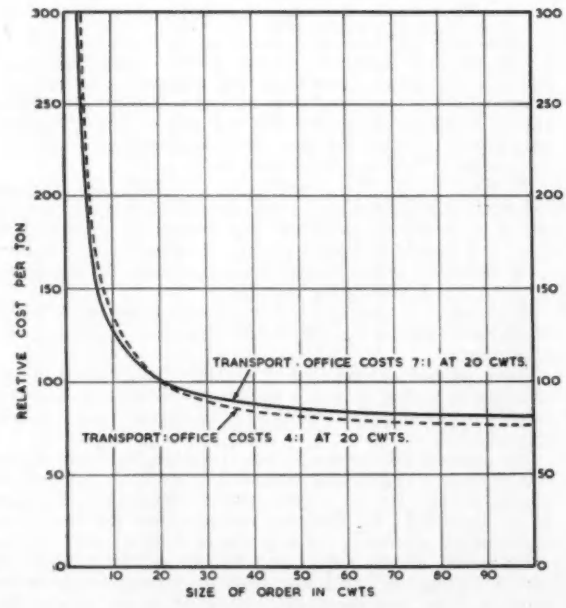


Fig. 4. Total costs.

The Symposium at the Research Meeting was rightly concerned with problems of quantity and quality, but in view of the progress made urgent consideration must be given to the distribution problem. This is not only a commercial matter, but, as it starts with loading and is involved with stocks, it vitally concerns the gas engineer.

Increased Handling

It must be recognised, also, that the development of the domestic market is characterised not only by poor load factor and small units of delivery, but is entirely sack business. In contrast with the 'commercial' trade, the 'domestic' presents no opportunities for deliveries in bulk which so conveniently augment the transport service at times of pressure. The poor load factor implies that somewhere room has to be found for bigger stocks and the means provided for coping with the increased handling which these entail. The line of movement is from works, often through merchants' depôts to consumers' premises and the right place for stocking coke is as far along this line as possible, preferably a store close to the appliance in which it will be used. But it is too much to expect consumers to do it all and therefore works and depôts must be increasingly prepared for what is required of them.

Much has still to be done, but the challenge has been accepted not only at the gasworks, where there have been developments in stocking and loading, but by certain distributors, also, whose enterprise in the installation of mechanised handling plant at depôts, and specialised transport has shown ways of accommodating more coke on a given site and of achieving greater flexibility in operation.

Summer/winter price differentials may assist to a limited extent, but generally speaking the existing storage is so small that even if filled to capacity in summer it cannot very well deal with the situation after Christmas and a few shillings per ton on a few hundredweights once a year will not go very far towards the cost of a new bin. The need is for something more than a purely seasonal incentive. Those who have scope for doing so should be encouraged to accept larger deliveries at any time of year.

The principal of a price related to the quantity delivered at a time was introduced in November, 1953, by the area gas board in the South of England in their new coke marketing schemes and price schedules. It was possible at that time to give full effect so far as contract prices were concerned and in the opinion of many this had a very significant and worthwhile effect. Many customers took advantage of the saving, even to the extent of making structural alterations. On the retail side of the price schedule it has so far only been possible to apply the principle to a limited extent, but it should be possible. in relation to costs, to link retail prices, too, with the unit of delivery in a way that would ease the problem and be fair to customer, distributor and producer.

DISCUSSION

Before the paper was read, **Sir Henry Jones,** President of the Institution of Gas Engineers, said that they were in an industry based partly on coal and partly on oil. Almost every day one read of some development in atomic fuel development—only recently the Queen opened Calder Hall atomic power station. 'I wrote to the Chairman of the Atomic Energy Authority and congratulated him on what, by any standards, was a fine performance technically, in the building of the power station in such a short time from the date on which the site position was chosen.

'He thanked me,' went on Sir Henry, 'but at the same time said he hoped that all this work would on no account decrease our efforts in the efficient use of the fuel, simply because this source of power was coming into full scale use.' During the next ten years or so, said Sir Henry, something like 40 mill. tons of coal equivalent would have to be produced in this country from coal or oil or both.

Dr. J. Burns, G.M., Chief Engineer, North Thames Gas Board, said he would not attempt to expound any policy but would try to approach this problem strictly from the commonsense point of view—the point of view of the man in the street. Which came first, he asked, the supply of the smokeless fuel or the demand for it? That was a question to which,

obviously, there was no definite answer. The demand for increased supplies of solid smokeless fuel would come in a relatively gradual way. The British householder was, among his other attributes, very conservative by nature and in some respects somewhat selfish in his conservatism. He paid tremendous lip service to the evil effects of smog, but was prepared to continue for a long time with the use of coal in an open fire for domestic heating because of the comfort which he thought it gave him, and he was quite prepared to forget the effect of the smoke going up his chimney on his own property and his neighbour's property. It was going to take, in Dr. Burns' opinion, more intense public education, coupled with a degree of compulsion, before there was any rapid acceleration in the rate of smokeless fuel usage. The 'smog' of 1953 had a tremendous effect in educating the householder, but with successive relatively smog-free years that education tended to be forgotten. Compulsion would be added, no doubt, and the authorities would probably see fit to impose smokeless areas in specific parts of the country. In the first place they would no doubt be in the nature of testing grounds and the success of these would probably determine the programme for the future.

Symposium on Gas?

The gas industry had two materials to offer—gas and coke—and it would be wrong to attempt to underwrite the importance of either of them. Some day there would be written a symposium on gas, which would be of great value in assessing the potentialities of gas in relation to the Clean Air Bill. 'We may think that this is already well known, but, just as with coke, the wealth of knowledge which can be pin-pointed and crystallised by discussion up and down the country on a subject of this sort is amazing.' They could, however, determine in broad terms what the principal drawback was to the use of gas to replace solid coal in the domestic grate: That was, undoubtedly, price and price in relation to other fuels, especially for base-load heating. The commonsense answer was that the industry should attempt to cheapen the cost of gas production as much as possible, and this could, *inter alia*, depend upon two things:

(*a*) The availability of more economic raw material—in this oil offered some hope as well as some fears;

(*b*) bringing the value of coke up to its true value relative to coal.

On the question of coke they were, to some extent, circumscribed by the type of plant which they possessed and the type of raw material which the Coal Board were prepared to supply, but he thought the coke symposium did show how, with the types of plant which they had got and with the types of coal which were available, they could increase the availability of coke and alter the coke/gas ratio. He would pick out only one exercise from this—and that was how fundamental knowledge of coal constitution and composition, coupled with accurate observation of the behaviour of different types of coal in a carbonising plant, could lead to developments which might be of value to the industry. They knew, for instance, that sized coal gave a greater throughput in a carbonising plant; that low rank coal, because of its composition, gave a greater throughput; that the higher the calorific value of the gas produced the higher was the throughput and the higher the coke/gas ratio. A study of these factors, coupled with a knowledge of work which had been done before, led the North Thames Gas Board to carry out full-scale trials on the carbonisation of coals, at present used in the domestic market, for the production of a specially free-burning domestic coke with the production of gas at 500 B.Th.U. Our trials in this direction had been very well reported and Dr. Burns said he thought it of interest to relate that the Board had set out on a programme for the production of 75,000 tons of a specially free-burning material named 'Cleanglow.' This material was not intended to replace ordinary open fire coke, which was such a successful fuel in specially-designed grates, but it was primarily intended to replace the use of raw coal in an ordinary stool grate, or, better still, to replace the use of raw coal in a properly designed grate.

This constituted one interesting development but, as Mr. Rose so very clearly set out in his paper, the open fire coke business constituted only a very small part of the coke business as a whole and the industry had much work to do to provide for consumers the right type of coke for their purpose and to provide that coke in the cleanest and best-graded form.

Principles Accepted

Sir Henry Jones said the Symposium had been discussed at the Autumn Meeting of the Institution in 1955 and at District Section meetings in Newcastle, Birmingham, Llandudno and Bristol. It was also discussed in September this year at a meeting of the Scottish Association of Gas Managers. In all these discussions the basic soundness of the papers in the Symposium had not been challenged seriously although in certain places some doubt has been expressed as to the practicability of producing gas of 500 B.Th.U. from low rank coals in installations of vertical retorts which, on account of age, were not in first-class condition. Broadly speaking, however, the principles expounded in the Symposium appeared to have been accepted.

It was, however, one thing to make more coke available at the gasworks for sale to domestic consumers. It was another thing altogether to prepare, bag and deliver this coke to domestic consumers who were all limited in the amount which they could accept in one delivery. Sometimes the limitation might be for financial reasons but, more often, especially in urban property, it was due to the purely physical dimensions of storage space.

Mr. Rose had contributed a most valuable paper which described the problems which had to be solved if coal now used by the domestic consumer was to be replaced by coke. His paper was worthy of much study and the problems which he enunciated must be common to many area boards. They could be solved in various ways but most likely a combination of methods will be necessary. Consumers must wherever possible be provided by the owners of houses with more accommodation in which solid fuel could be stored. In this connection, Sir Henry said, he had found that coke stored outdoors was a pleasanter substance to handle than coke stored under cover. The effect of moisture derived from rainfall was very small when the coke was used on the open fire or in a closed appliance. Periods of snow provided perhaps the most serious objection to the storage of coke outside the house, at any rate for part of the amount stored.

Engineers Could Advise

Next, provision must be made for the storage of coke as near as possible to the customers who would require it when the weather turned cold. This involved the holding of stocks by merchants at all their depôts and the recovery of coke from stock in a suitable state for delivery. It might be that gas engineers could give helpful advice to coke distributors about the installation of simple types of equipment for the recovery of coke from stock and its preparation for bagging.

On coke quality, he went on, it should be remembered that while the special fuels now being produced, such as 'Cleanglow,' certainly met a public need for a fuel which was more controllable in use than coke, and which would therefore give even better results burnt in a modern appliance, the main tonnage of coke to be used in place of coal consequent upon the Clean Air Act must be coke of traditional type. For this reason, it was up to gas engineers to aim at a standard of coke quality which would give first-class results in modern appliances although it would not be capable of use, as 'Cleanglow' was, on stool bottom grates and other old-fashioned equipment.

No doubt managers of transport departments would study the costs quoted by Mr. Rose with great care and, in conjunction with coke selling staffs, examine ways in which economies could be effected, or at any rate encouraged. The situation disclosed on the level of orders in hand must be a source of anxiety to everyone concerned. It was difficult to see how coke would ever become a popular fuel until this log-jam of orders could be avoided. As he had already indicated, a combined operation was required from householders, coke distributors and coke producers.

Mr. W. T. Candlin, Assistant Coke Manager, South Eastern Gas Board, said: 'We have been talking about smoke control areas for two or three years, and we are now on the verge of another winter. It might be from three to five years before we find anything at all coming from the increased domestic load.' He felt that the difference in price between domestic coke, at 9s. 1d. per cwt. and 'Cleanglow,' at 10s. 6d., was too narrow. He also mentioned the supply factor. 'We have in

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front of us the serious problem of the extremely large stocks we have got to hold and of the very large increase which we have got to pay on our supply system.'

Mr. Rose said he believed that even with the 9s. 1d. coke well over 90% of it was largely good coke—'I would not say it is 100% '—but he thought a lot of it was very good and well worth the charge.

Mr. L. Curry, Rickett, Cockerell & Co., Ltd., said Mr. Rose's paper underlined the fact that there were problems associated with coke sales not associated with the quality of the fuel. If something was not done about it soon the costs of distribution would rise considerably, or the standards of delivery service would be reduced. The only way to do it would be to persuade the consumer who had ample storage space to fill it, especially in the summer. If this was not done how could they fulfil the demands of those who had not proper storage facilities? Unless a publicity campaign was launched to persuade the customer to take the coke he did not really see how the distributor could help. Most of their depôts were full, consumers were holding off until the very last moment.

Mr. R. Slaymaker, Transport Manager, South Eastern Gas Board, mentioned the human element involved in delivering sack coke in lorries, and the fact that drivers were willing to get up early in the morning in order to arrive at the works early. There was one thing which would attract the crew of a coke lorry to do that in the middle of a winter and that was reward for their effort. He had been told by his colleagues that 'cokies' were a dying race. 'Every man has his price, and I submit that what you have to do is to offer these men an incentive to get the maximum amount of work done in one day.'

Mr. A. Beckett, E. & A. Shadrack & Co., Ltd., said the two most important items were collecting and despatching. At the larger works today there was a tremendous delay and unfortunately inevitable queues. He thought the tendency for the men to arrive early in the morning was a very bad thing.

Mr. Candlin: Have you considered overnight loading?

Mr. Rose said it was found that men liked the first load, but so often it would not appear necessary that they should come along so early.

Mr. E. O. Rose, Tottenham, said he questioned whether the author, in trying to measure the demand for coke, had really measured something else—the orders. He had assumed that the orders represented the demand. Most people had an average of 5 cwt. of coke every 3-4 weeks. As soon as Christmas was past they put in an order for the next delivery. They found that they could run 3-4 weeks behind and satisfy the demand by people who had been caught out, with a special delivery.

Mr. W. R. Branson, W.M.G.B., speaking of premium fuels, said the local authorities seemed to think that the gas industry was on the point of producing the answer to their prayers—which would produce smokeless zones for them without their putting their hands into their pockets. He said he was just a little afraid that the publicity given might have detrimental effects on the development of smokeless zones. He wondered whether, in fact, they should not concentrate on improving the quality of the stuff sold.

Dr. F. J. Eaton said the author rather suggested that it would be very convenient if the housing authorities were to put in the closed type of appliance. The local authorities had a certain capital sum which they were permitted to spend in connection with their housing. But out of that sum they had to provide the appliance and they only went for the cheapest one. It so happened that the open fire was about the cheapest. The only way in which any other sort could be provided was for the user to pay for it, which was the case on the Continent.

Mr. A. Hilliard, Coke Officer, West and East Surrey Divisions, S.E.G.B., said there were a few hard facts the coke industry was afraid to face. There was the closing of gasworks, which made transport difficulties very much harder. And there was the difficulty in obtaining transport. If one went to the Ministry of Transport to get a licence for a vehicle for this purpose the Ministry demanded that it was used for a minimum of 4½ tons a week.

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Abstracted from a paper presented to the Manchester and District Section, I.G.E. on October 19.

Complete Gasification

By I. J. HARTILL, A.M.Inst.Gas E.,
SENIOR ENGINEER, PRODUCTION, TECHNICAL, AND PLANNING DIVISION, NORTH WESTERN GAS BOARD

TWO-STAGE coal water gas plants consist essentially of a retort superimposed upon a water gas generator. The gasification of the coal thus takes place in two stages. In the first, coal is carbonised in the retort and, in the second, the coke produced in the retort is converted to water gas in the generator. The gases produced by carbonisation may be passed directly to the wash box or through the carburettor. In the latter case the tar produced is cracked to increase the calorific value and gaseous thermal yield. The calorific value of the mixed gas produced is about 330 B.Th.U. per cu.ft., and may be enriched by conventional carburetting. This method of gas manufacture was developed about 50 years ago in this country by C. B. Tully and on the Continent by Strache.

The North Western Gas Board first became interested in this method of gas manufacture some three years ago, when ways and means were being sought to increase the range of coals which they could use. It seemed then that such plants had a number of attractive features:—

1. The process was well established both in this country and on the Continent.
2. Gas could be made either from coke or from a range of coals which were unsuitable for normal high temperature carbonisation.
3. The gas would be the ideal 'carrier' for the Rochdale process which was then being developed.

The Board has recently installed at its Kendal undertaking a .5 mill. cu.ft. per day Tully plant. The plant was of simple design and it was decided to investigate its performance so that the merits of the process could be assessed.

The arrangement of the plant is shown in *Fig. 1.* It will be seen that the plant consists of a water gas generator, superimposed retort, carburettor, and superheater. The plant was hand charged and clinkered, and mechanically operated. During the up-run the retort gas and up-run wash box valves were open so that some water gas passed up the retort and from there direct to the wash box, and some passed through the carburettor where it was enriched by carburetting with oil.

The quantities of gas which passed in either direction were controlled solely by the relative back pressure of the retort on the one hand and the carburettor and superheater vessels on the other. During the back-run, only the back-run wash box valve was open and steam passed through the superheater and carburettor, about the retort and through the fuel bed.

The results of a test made on the plant were rather disappointing. It was clear that the efficiency of carbonising was very poor and that this in turn was leading to severe channelling in the fire bed. Fire bed conditions were made much worse by the fact that the blow gases left entirely at the periphery of the fire. The air consumption was high and although the fire was very hot at the periphery the steam consumption was excessive.

The poor yield of gas obtained from the oil was attributed to the fact that insufficient water gas passed through the carburettor to maintain a satisfactory hydrogen/oil vapour ratio. This was confirmed by operating the plant as a conventional water gas plant, with the retort gas offtake blanked off so that all the water gas made passed through the carburettor; 1.35 therms per gal. of oil were then obtained.

Before any improvement in operating results could be obtained, it was necessary that the carbonising efficiency should be improved which, in turn, would lead to improved fire bed conditions. Carbonisation in this type of plant is, of

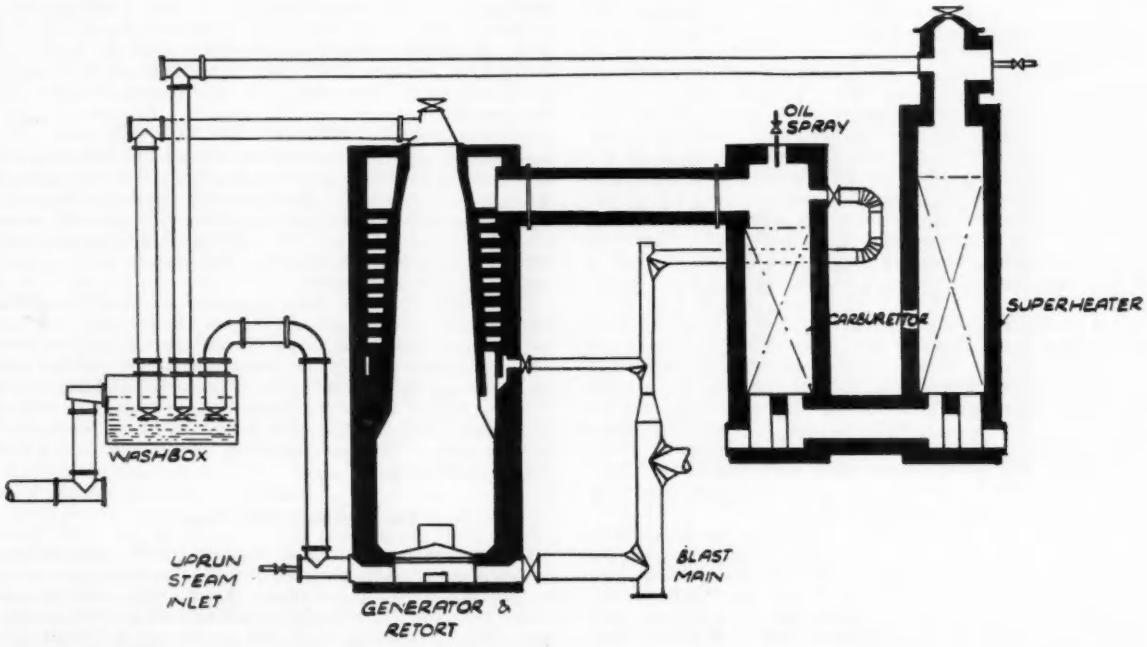

Fig. 1.

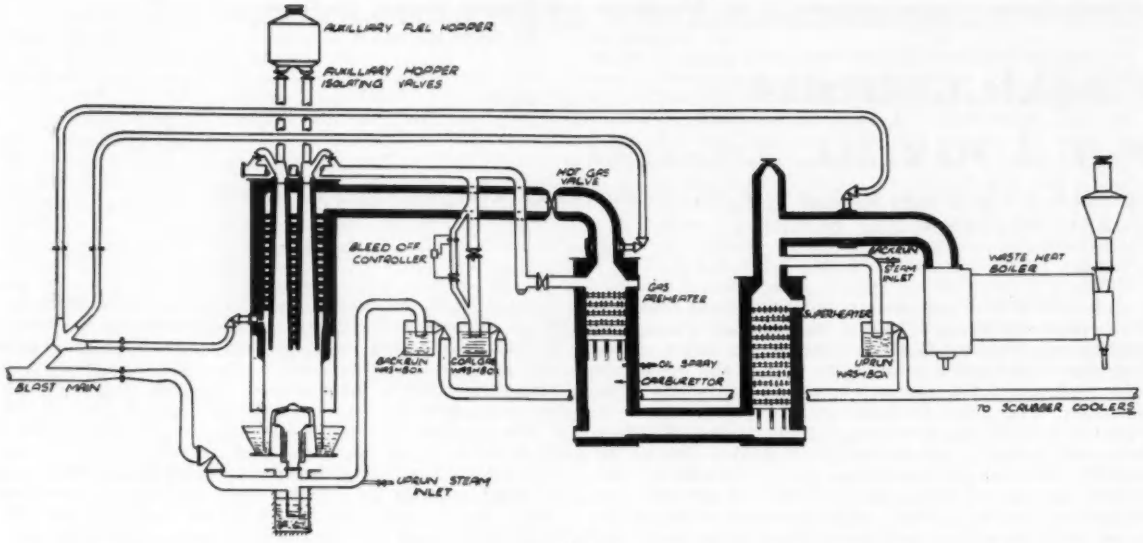

Fig. 2.

course, at low temperature and it should be noted that the over-all efficiency of the plant is much more dependent on fire bed efficiency than carbonising efficiency.

Three methods have been used to supply the carbonising heat requirements. They are:

1. From the sensible heat and potential heat in the blow gas.
2. From the sensible heat in the blue water gas.
3. By injecting into the base of the retort blue water gas which has been heated regeneratively by the blow gas.

The first two methods are used in the Gaz Intégral and Tully systems, and the third has been used by Humphreys and Glasgow and by Travers and Clarke, who maintained that insufficient heat could be made available from the other sources.

Gains Lost

Assuming final carbonising temperatures between 600° and 700°C. it can be shown that at 600°C. the heat requirements can be provided fairly comfortably from the blue gas and the blow gases, but that at 700°C. additional blowing would be required and any gain in carbonising efficiency would be lost in the generator. The heat transfer surface required in the retort for carbonising at 600°C. is about 460 sq. ft. per ton of coal per hour. The height of the retort is fixed for practical reasons at about 18 ft., hence while the capacity of the retort increases directly with the generator diameter, the generator capacity increases as the square of its diameter, so that as the generator diameter increases plant output falls off as compared with a normal water gas plant. Dr. Bronowski has shown that there is a very sharp rise between 600° and 700°C. in heat requirements caused by endothermicity, and it is this which virtually rules out carbonising at 700°C. in two stage plants.

If we are prepared to drop the carbonising temperature to 500°C. then the carbonising heat requirements can be almost met by the sensible heat of the water gas, so that the capacity of a two stage plant would be about the same as for an ordinary blue water gas plant of similar size. The thermal efficiency of the process might not suffer over-all, but there would be a drop of about 10% in the calorific value of the gas made. The plant output could be increased by superheating the steam and eliminating the back-run, and the increase thus obtained might be 10%.

At Kendal only about 60-70% of the water-gas was passing up the retort and as a first step in modification it was decided to insert a hot gas valve between the generator and the carburettor so that all the water gas would pass up the retort. A bypass line was put in between the retort top and the wash box. Gas was blown off during the blow and as the gases leaving the retort top were cold (about 130°C.) it was necessary to place the oil spray at the base of the carburettor.

A striking improvement in results was obtained especially with regard to steam consumption. There was also a very considerable reduction in smoke production, but the fire centre was relatively cool. Further modifications were therefore made. The main modifications were the conversion of the superheater to a regenerative steam superheater and the replacement of the single retort by two, to increase the heat transfer area and to provide a central outlet from the generator in blow periods. It was necessary to instal a higher power fan.

After modification the plant was first run on coke and we were disappointed to find that there was no appreciable reduction in fuel consumption by the use of superheated steam, the principal effect being to reduce steam consumption from 40 to 35 lb. per 1,000 cu.ft.

When the plant was changed over to coal the first major difficulties were encountered. Glasshoughton washed nuts were used as in previous tests and this coal held up badly in the retorts. On discussing this problem with the National Coal Board it was found that this coal was a mixture of a number of seams with the swelling number varying from 1½ to 3. By making special arrangements with the colliery it would have been possible to exclude the high swelling seams, but it was found that even when the swelling number did not exceed 2½ hanging up still occurred. Because of this a switch was made to Bestwood washed household nuts. This is a rank 902 coal with a swelling number not exceeding 1½, and no difficulty was experienced in passing this coal through the retort. This coal did have some disadvantages in that it tended to decrepitate and gave a more or less infusible dusty ash. Both these factors tended to increase the pressure drop through the fire bed. Additionally, the inherent moisture content of this coal was about 10%.

The results of a test were excellent when considered on the ash free dry basis (197.88 therms per ton) with no fuel loss in the ashes. This figure is equivalent to carbon consumption in the generator in normal water gas practice and the reason for the large difference between this and the therms (139.87) on the 'as-received' basis was the high inert content of the coal and the fact that this coal has a somewhat infusible ash. With hand clinkering this leads to heavy loss of fuel in the ashes.

The Wallasey Tully Plant

The improvement in results obtained by the modifications to the Kendal plant was sufficiently encouraging to justify the installation of a larger plant. Accordingly, an order was placed with the Tully Engineering Co., Ltd. for two plants, each having a capacity of 1 mill. cu.ft. per day when carburetting with gas oil to a calorific value of 450 B.Th.U. per cu.ft.

When the order for these plants was placed, the second set of modifications at Kendal, although envisaged, had not been made, and it was not felt that we could risk installing, on a plant that was intended for routine production purposes, two additional hot gas valves and a dry sealed grate, with which we had had no experience.

The arrangement of the plant is shown in *Fig. 2*, and the cycle of operations in *Fig. 3*.

It will be seen that the plant has a hot gas valve between the generator and the carburettor vessel so that all the uprun gas made passes up the retort and down through a gas preheater into a chequerless carburettor. A chequerless carburettor was used since the possibility of enriching the gas with heavy oil was considered. Twin vertical retorts having a heated length of 18 ft. 0 in., major axis 6 ft. 3 in. and minor axis 18 in. at the top tapering to 24 in. at the bottom, are erected above the generator. The plant is designed for intermittent charging, being shut down every four hours to fill the auxiliary hoppers. In order to avoid the use of a dry sealed grate the generator has been conservatively rated and has a diameter of 6 ft. 9 in.

The coal is fed from the auxiliary hopper into the retorts by means of two 12 ft. long charging tubes. The purpose of these tubes is two-fold. Firstly, they provide a ready means of checking the rate of coal descent down each retort and, secondly, they provide ample head room above the retort so that any retort blockings may be easily cleared. There is an individual gas offtake from each retort, each offtake being fitted with a thermometer and a butterfly valve so that the volume of gas passing up each retort may be regulated.

Two blowers are installed, one an electrically driven fan and the other a Rootes type blower driven by an Allen steam engine. The Allen engine exhausts at 15 p.s.i.g. into a steam accumulator and process steam at 8 p.s.i.g. is drawn from the accumulator. Each blower is designed to pass 7,500 cu.ft. of air per minute against a back pressure of 36 in. w.g.

The gas is cooled and detarred in a scrubber cooler, the hot liquor from the scrubber being cooled in an induced draught tower. A by-pass is provided to bleed coal gas from the top of the retort during the backrun and blow, the amount of gas passing being controlled by an Electroflo regulator.

The plant instrumentation is as for a normal water gas plant, with the addition of thermocouples about the retort. Because of the relatively large surface area of the vessels, special attention has been paid to the lagging of the retort vessel, carburettor, and superheater. The cycle is controlled by a mechanical operator, the timing quadrant of which gives a minimum phase time of 10 seconds and a maximum of 120 seconds, the phase being adjustable in 5 second steps. The cost of the plant, including the building, foundations, coal handling plant, scrubber coolers and cooling towers was £185,000.

Working Experience and Results

The plant was commissioned during September and was at first run as an ordinary water gas plant. After its mechanical reliability had been established, the plant was changed over to coal charging. The coal used was the Bestwood coal which had been successfully used at Kendal. Within 24 hours of changing over to this coal the plant output was down from 44,000 cu.ft. per hour to about 27,000 cu.ft. per hour. Examination of the fire showed that about 80% of the generator fuel and broken down in size to below ½ in. Additionally, the ash produced was very dusty. As a result the pressure drop across the fire went up to 20 in. and the primary air rate was reduced from 4.800 cu.ft. per minute when running on coke to 2,900 cu.ft. per minute.

Bestwood is a rank 902 coal and produces a fragile and friable coke and it was clear that the coke was unable to withstand the head load of fuel which was much greater in the Wallasey plant than at Kendal.

In order to obtain a stronger coke, it was decided to change over to a rank 802 coal. The coal selected was Creswell washed cobbles, sized between 2 in. and 2½ in. This coal has a swelling index of 3½ and in view of our experience with the Glasshoughton coal at Kendal we were a little apprehensive of holding in the retorts.

Results of a test carried out with this coal showed that 251 therms were made per ton of coal as received and 183.8 on the dry ash-free basis, i.e., somewhat lower than those obtained at Kendal. The most surprising feature is the very low steam consumption. This is believed to be due to the high reactivity of the coke which is something of an embarassment since it reduces the sensible heat available for carbonisation.

The cost of gas manufacture is as follows:—

Output 2,200,000 cu. ft. per day, calorific value 450 B.Th.U. per cu. ft. Load Factor 280 days per year

	£ per annum	Pence per therm
11,300 tons of coal at 104s. per ton	58,700	5.08
812,000 gal. of oil at 12.25d. per gal.	41,300	3.58
59,200,000 gal. of water at 2s. 6d. per 1,000 gal.	742	0.06
Electricity 0.2 kW per 1,000 cu. ft. at 1.0d. per kW	513	0.04
Labour 2 men per shift	3,650	0.32
Purification 0.5d. per 1,000 cu. ft.	1,280	0.11
Maintenance 1½% on capital	2,780	0.24
Management charges	1,000	0.09
	109,965	9.53
Credit:		
212,600 gal. of tar at 7.6d. per gal.	6,730	0.58
20 lb. of steam per 1,000 cu. ft. at 1s. 6d. per 1,000 lb.	92	0.01
Net cost	103,143	8.94
Capital Charges:		
On Plant only, 7½% on £185,000	13,850	1.20
Total cost	116,993	10.14

It will be seen that we have been forced from time to time to change our opinion about the suitability of various coals for use in two-stage water gas plants and that we cannot, as yet, offer any final conclusions.

We can only say yet that coal for use in these plants should be clean, and sized above 2 in.; should not decrepitate on heating; should not produce an excessively friable coke; and should travel freely through the retort.

For practical reasons the last is the most important property and it is also the most difficult to predict, concentration of swelling index alone not being a sufficient guide to a coal's suitability in this respect.

Renaudie and Pirou* have developed a method for the selection of coals which simulates in the laboratory the carbonising

* 'Development of apparatus for the selection under laboratory conditions of coals for use in Complete Casification plants.' International Conference on Gasification of Mined Coals, Liege, 1954.

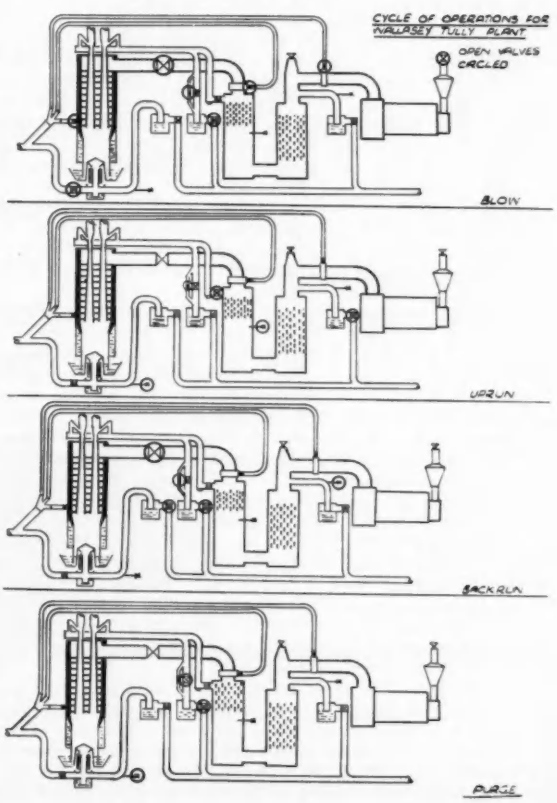

Fig. 3.

conditions in a two-stage gasification plant. Their published results, however, would seem to exclude the use of coals with a swelling index of 3½, and we have seen that at least one coal with this degree of swelling is suitable. Probably the best test would be the agglutinating power of the coal, but we have, as yet, done no work to support this view.

At present the coal rank classification numbers are felt to offer the easiest means of coal selection. It would seem that rank 802 coals are the most suitable, with rank 702 coals being excluded because of their greater agglutinating power, and rank 902 coals being excluded by reason of the fragile coke which they produce. It is recognised that only the use of 902 coals would really extend the range of coals which could be used by the gas industry, but unless a coal of this rank can be found which will produce a reasonably strong coke it will be unsuitable.

If the coal were carbonised regeneratively by the sensible heat of the blow gases it would be possible to use a much shallower retort, and rank 902 coals might then be usable. The high inherent moisture content of these coals, however, makes their transport for any distance unattractive, and there is no economic incentive for the development in the area of the North Western Gas Board of a gasification process especially for their use.

In conclusion it may be said that the Wallasey plant is a successful implementation of the principles developed at Kendal. If the Wallasey plant were being built today, however, it is probable that a dry grate would be fitted to enable a wider range of coals to be used and to give higher output.

DISCUSSION

Mr. J. E. Tully complimented Mr. Hartill on the work that had gone into the paper. Those who had experience of development work knew of the immense difficulties and practical problems and of the patience and endurance and the physical hard work that had to be done to find the answers.

Mr. Tully said he was interested to find little reference to complete gasification in the paper, but a preference for the term coal-water-gas. Many terms were used to describe this type of gas but they amounted to the same sort of thing. These different names were confusing and he thought an authoritative body, such as the Institution, should recommend a standard terminology. The subject of this paper was really carburetted complete gasification. This was a more complex process than straightforward gasification of coal at 330 to 340 B.Th.U. per cu.ft.

As the paper inferred, the main engineering problems associated with this type of plant had now largely been overcome but it was still difficult to predict what any particular coal would do in any particular plant.

Mr. J. Graham (Lancaster) said he admired Mr. Hartill's pluck in bringing such a paper to the notice of members. It showed the defects in the production of water gas in two stages and was one of the best advertisements for the straightforward production of water gas.

Mr. A. K. Collinge (Preston) said reference was made to Travers and Clarke and he wished that had been pursued further. In 1924 a paper was presented to the Institution by Dr. Travers on their original complete gasification system. This was developed and three plants constructed, one of these being at Preston. Dr. Travers produced evidence that additional heat was necessary to carbonise coal in the retort section and that this might be obtained by re-circulation of heat and blow gases from the generator.

Modifications were carried out on all three plants and those at Preston were the subject of a paper he (Mr. Collinge) gave to Manchester Juniors in 1928. Mr. Collinge said the results achieved at Preston and quoted by him in his paper were in excess of those now given by Mr. Hartill. The coal gas therms per ton of coal (as received) were 171.4 compared with 139.87; calorific value was 440 compared with 434; and the oil used was 0.88 compared with 0.91. There was no selected coal and the ash content varied between 2 and 16.

Mr. Collinge said he regretted that the Preston plant had not been further developed. It was apparent that they were still struggling to achieve results of 30 years ago. Members might wonder why further development did not take place. One of the two patentees, Mr. Clarke, died suddenly, and Dr. Travers was a professor of chemistry at Bristol University with world wide interests. On top of this there was the depression of the 1930's and ultimately the plant was closed.

Dr. Travers, now in his middle 80's, was living in retirement but he retained a keen interest in the gas industry.

Mr. R. E. White (Leeds) recalled experience on a Travers-Clarke plant at Millhill, and could sympathise with Mr. Hartill in the work he had been doing. The best result achieved at Millhill was 355 B.Th.U. per cu.ft. and they even carburetted tar in that plant.

Mr. F. Litler (Headquarters, North Western Gas Board) said anything increasing the thermal yield of a plant from 157 to 184 therms was worthy of note. Mr. Hartill had worked with determination to achieve his object. What was the future of complete gasification, asked Mr. Litler. The immediate future was very limited and to a very large extent would be covered by the Clean Air Act. An increased demand could be anticipated for smokeless fuel. In the North West complete gasification had application as a carrier gas diluent. Many of the coals suitable for the plant at Wallasey could be tried to produce a highly reactive and smokeless fuel.

Demand for solid smokeless fuel would have to be increased in the next ten to 20 years. The housewife would not give way quickly to smokeless fuel. He believed demand for solid smokeless fuel would reach its peak in 15 to 20 years and that in 25 to 30 years she would demand heat through a pipe or through a wire. They had to see that it was delivered through a pipe.

Mr. Litler said he thought there were good prospects of increasing use of complete gasification in 15 to 20 years possibly by way of the Lurgi process or hydrogenation. Mr. Hartill's work was extremely helpful in the interim period.

Mr. W. Morland Fox (W. J. Jenkins & Co., Ltd.) had had some experience of systems operated in South Africa. The keynote of their success was using semi-standard water gas plants and distributing gas of a calorific value of 400 B.Th.U. They faced up to the low c.v. and came down to the point of a one fuel industry.

Mr. L. S. Pickles (Hebden Bridge) said the two important factors were the type of coal and obtaining a sufficiently high temperature. He had made higher calorific value gas and had the plant working satisfactorily once he got the temperature right. Working conditions for the operator, however, were NOT pleasant.

Reference to the VIAG plant, which was now being developed in this country by Woodall Duckham in conjunction with North Thames Gas Board, was made by **Mr. W. S. Hubbard** (Liverpool). In 1947/8 he went to Italy and saw the VIAG plant working in Rome, Naples, and Padua. In all cases the plants were not carburetting and were concerned with the dilution of rich gases from retorts. Two-stage production was not new. It was very useful in application specifically for one purpose—dilution of rich gases. He believed they would have to move on these lines. This plant should not be deprecated but it must be regarded as complementary. Mr. Hartill's work had been very useful.

Briefly replying to the discussion, Mr. Hartill said he was familiar with the Travers & Clarke method but as they were dealing with a Tully plant and the carbonisation of coal by a different principle they decided to develop that method to a logical conclusion rather than something different. He added that the whole object of two-stage gasification was to preserve the coal hydrocarbons as much as possible. Mr. Hartill said he agreed with Mr. Hubbard that the most useful application was concerned with dilution.

Mr. R. L. Greaves (senior Vice-Chairman) who proposed the vote of thanks, said the paper had provoked a useful discussion. Work in developing this plant had been well spent.

Mr. Greaves said he was a firm believer in a two-fuel industry. We would be a solid smokless fuel industry for a long time ahead and he hoped on a future occasion to write of certain of the plants in which he was interested. He looked forward to hearing in due course a progress report on these complete gasification plants when commercial costs and figures were available.

Seconding the vote of thanks, **Mr. J. G. Tilly** said the paper must be regarded as an interim report because the Wallasey plant had been working for only a short period. The paper described the approach to one of the great problems of production from low grade coals and was not intended to be the solution. It was useful to get first hand knowledge of any development work that was going on.

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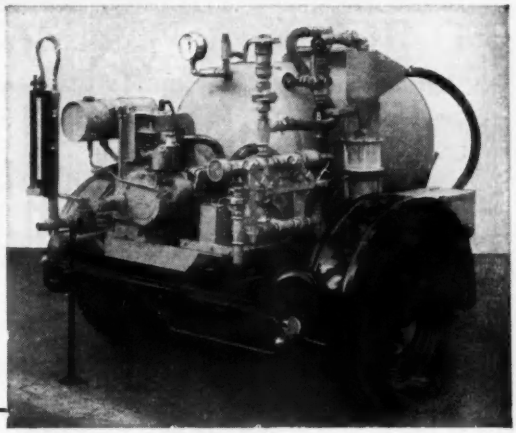
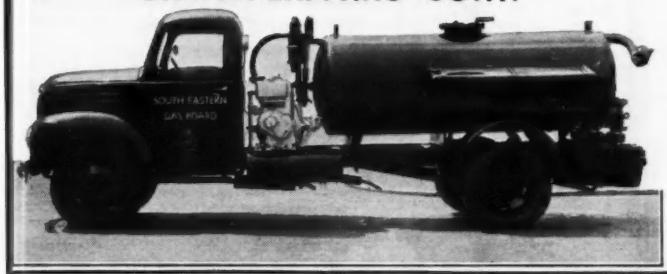
The 75 gallon Allan Taylor pressure/vacuum service cleaning equipment is complete with exhauster which can be used for vacuum or pressure. Normally used as a trailer unit and towed by a 10 cwt. van. Visible in the photograph (*right*) are the cyclone and test bar. This additional equipment enables the operator to make pressure tests before and after cleaning the service pipe, the test taps passing 50 cu. ft. or 100 cu. ft. as required. By using the Cyclone the dust drawn from the service pipe is deposited in the sight glass for inspection and can then pass into the easily removable container below. The arrangement further enables the operator at the machine to determine whether or not there has been any success with a cleaning operation. The extractor also prevents the greater part of the rust dust from entering the 75 gallon cylinder.



SYPHON EMPTYING OUTFIT



The Vacuum Syphon Emptying Outfit illustrated is mounted on a 4 ton **Thames** Chassis. A 600 gallon galvanised tank is fitted. A rotary type exhauster is driven by a 4 b.h.p. four-stroke air cooled engine, mounted on a sub-frame behind the cab. The tank is fitted with a flame-proof vent and the outfit can be used for high or low pressure syphon emptying. A large manhole at the rear allows the tank to be cleaned easily. A sight glass is fitted to enable the operator to know when the Syphon is emptied. Twenty-five feet of 1½ in. suction hose is supplied with the outfit. The outfit can be used for vacuum or pressure working.

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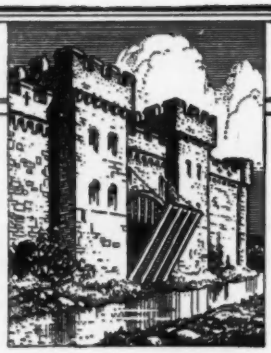

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APPOINTMENTS VACANT

COKE OVEN CHEMIST is required for an integrated Iron and Steel Works in the Midlands. Applicant should have experience of Modern Coke Oven Plant. Some shift work is involved. Housing prospects are good and the successful candidate will be required to join the Staff Pension Scheme. Please apply, stating age, qualifications, experience and salary required to: Manager/Personnel, Stewarts and Lloyds, Limited, Corby.

SCOTTISH GAS BOARD

GRANGEMOUTH DISTRICT
ASSISTANT ENGINEER AND MANAGER

APPLICATIONS are invited for the above post. Candidates should be familiar with the working of continuous vertical retorts and the usual types of ancillary plant.

The salary for the appointment will be within the range of Provincial "A" A.P.T. 5-7 (£575-£750 per annum) with placing in accordance with qualifications and experience. A house is available at a reasonable rent. The position is pensionable, and the successful applicant will be required to pass a medical examination.

The post offers good opportunities to a young man anxious to gain experience in all aspects of manufacture, distribution, sales and administration in a town with expanding modern industries.

Applications stating age, and giving full particulars of education, training, experience and qualifications, should be addressed to the District Manager, to arrive not later than Saturday, November 24, 1956.

J. D. CAMPBELL,
District Manager.

Gas Works Office,
Dalgrain Road,
Grangemouth.

SCOTTISH GAS BOARD

KILMARNOCK GROUP
ANNAN DISTRICT
APPOINTMENT OF DISTRICT MANAGER

APPLICATIONS are invited from suitably qualified persons for the post of DISTRICT MANAGER of the Annan District Gas Undertaking.

Applicants must be experienced in the administration and supervision of a gas undertaking and possess a sound practical knowledge of horizontal retorts, distribution practice and general office routine.

The salary applicable to the post will be within A.P.T. Grade 9, Provincial 'B' of the Salary Scales of the National Joint Council for Gas Staffs (£740/£840), with placing according to qualifications and experience.

The successful applicant will be provided with a house at a reasonable rent.

The position is pensionable and the successful applicant will be required to pass a medical examination.

Applications stating age, and giving particulars of education, training, experience and qualifications, should be addressed to the undersigned to arrive not later than 14 days from the appearance of this advertisement. The names of two referees should be given.

ROBERT FIFE,
Group Manager.

Riverbank Gas Works,
Kilmarnock.
November, 1956.

THE METAL BOX COMPANY, LTD., The Technical Engineering Division require the services of a SENIOR ENGINEER to take part in supervision of their Field Erections in this country and overseas, dealing with Conveyor Ovens and Industrial Heating Processes generally. The successful candidate will need experience in this particular field and in overall supervision of outside work. The post which is one of considerable responsibility will be well paid. Applications with full information should be addressed to the Personnel Officer, Technical Engineering Division, The Metal Box Co., Ltd., Chandos Road, N.W.10.

WALES GAS BOARD

RHYMNEY AND ABER UNDERTAKING
TECHNICAL ASSISTANT—DISTRIBUTION

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT at a salary within Grade A.P.T. 5/7. The post is pensionable.

Candidates should have had experience in high and low pressure distribution systems, and will be required to assist generally in all aspects of Distribution work including gas fitting. The possession of the Institution of Gas Engineers' Higher Certificate in Supply or an equivalent qualification, would be an advantage. The successful applicant will be required to pass a medical examination

Applications giving age, together with details of education and experience and the names of two referees should be forwarded to reach the undersigned within 14 days of the appearance of this advertisement.

D. IDRIS ROWLANDS,
General Manager.

Gas Offices,
St. Martin's Road,
Caerphilly.

WALES GAS BOARD

MERTHYR TYDFIL AND DOWLAIS
UNDERTAKING

APPLICATIONS are invited for the appointment of ASSISTANT ENGINEER and MANAGER to the Merthyr Tydfil and Dowlais Undertaking which receives purified Coke Oven Gas from the Board's Grid System.

The applicant must have a sound knowledge of modern Distribution practice, Management and Administration.

Peak load carburetted water gas is manufactured. Ability to control these peak load plants is necessary and appropriate technical qualifications are essential.

The commencing salary will be within Grade A.P.T. 10A (£820 to £920 p.a.). A dwelling house (including fuel and light) situated on the "Willows Station" is available for which a reasonable rental will be charged.

Applications, giving details of age, qualifications, experience and present position, together with names of two referees, should reach the undersigned not later than Monday, November 26, 1956.

D. E. WEST, M.Inst.Gas E., M.Inst.F.,
Engineer & General Manager.

Gas Offices,
143, High Street,
Merthyr Tydfil.

WEST MIDLANDS GAS BOARD

WARWICKSHIRE DIVISION
ELECTRICAL ENGINEER (MAINTENANCE),
COVENTRY DISTRICT

THE position involves supervision of the maintenance and development of electrical plant associated with gas works processes.

As a minimum qualification, candidates should hold the Higher National Certificate in Electrical Engineering and should have had experience in heavy industrial electrification.

The salary will be within A.P.T. Grade 12 (£900 x £25—£1,025 per annum) of the National Salary Scales for Gas Staffs.

The post is pensionable, and the successful candidate may be required to pass a medical examination.

A flat will be available at a reasonable rental.

Applications, stating age, personal details, particulars of training, experience and qualifications, together with the names of two referees, should be addressed to Mr. A. Allen, Divisional General Manager, West Midlands Gas Board, Gas Street, Coventry, to reach him by not later than November 26, 1956.

J. C. INGRAM,
Secretary to the Board.

(*Classified advertisements continued on page* 448)

APPOINTMENTS VACANT (ctd.)

NORTHERN GAS BOARD

TEES-SIDE DIVISION

APPLICATIONS are invited for two TECHNICAL ASSISTANTS at the Stockton Unit:—

(1) Salary within A.P.T. Grade 8 (£710-£790 per annum) of the National Salary Scales for Gas Staffs. Candidates should be familiar with the operation of both Horizontal and Continuous Vertical Retort Plants. Experience in the Mechanical and Electrical Maintenance will be an advantage.

(2) Salary within Grade A.P.T. 5 (£575-£655 per annum) of the National Salary Scales. The candidates appointed will be required to undertake general duties in the drawing office, laboratory and works.

Both posts are pensionable and the successful candidates will be required to pass a medical examination.

Applications, clearly indicating the post applied for and stating age, experience, qualifications and the names of two referees, should be received by the undersigned not later than November 30, 1956.

JOHN W. PALLISTER.
Divisional General Manager.

Commercial Street,
Middlesbrough.

November 5, 1956.

EAST MIDLANDS GAS BOARD

LINCOLNSHIRE DIVISION
DIVISIONAL ENGINEERING ASSISTANT

APPLICATIONS are invited from suitably qualified candidates for the above appointment at Divisional Headquarters, Lincoln.

Applicants should have served a recognised apprenticeship in the gas industry, and have had experience of the layout and installation of new plant. Site experience in the constructional field would be desirable.

A degree in engineering and/or corporate membership of one of the Engineering Institutions would be an advantage.

The salary for the post will be within Grades APT. 10/12 of the National Salary Scales for Gas Staffs (£820/£1,025). The initial placing will be dependent upon the qualifications and experience of the successful candidate.

A Board's house will be available under the terms of a service occupation agreement and at a reasonable rent, if required.

ASSISTANT TO DIVISIONAL DISTRIBUTION ENGINEER

Applications are invited for the position of ASSISTANT TO DIVISIONAL DISTRIBUTION ENGINEER at the Divisional Headquarters, Lincoln.

Applicants should have had some practical experience in mains and service work generally and have considerable knowledge of the design of distribution systems, together with experience in the estimation of materials and costs. Preference will be given to a candidate possessing a recognised technical qualification.

The appointment will be made in a salary range rising to a maximum of £855, the commencing salary will be in accordance with the age, qualifications and experience of the successful candidate.

The above posts are pensionable, and the persons appointed will be required to pass a medical examination.

Applications giving full details of age, education, qualifications and experience together with the names and addresses of two referees should be addressed to reach the undersigned not later than November 24, 1956.

BERNARD CLARKE,
Divisional General Manager.

Belle Vue House,
Carline Road,
Lincoln.

November 9, 1956.

EAST MIDLANDS GAS BOARD

LEICESTER AND NORTHANTS DIVISION
VACANCIES FOR LOCAL SUPERINTENDENTS/MANAGER

APPLICATIONS are invited from suitably qualified persons for the under-mentioned vacancies, at commencing salaries within the grades stated. The successful applicants will be required to reside in the houses attaching to the appointments, which will be available on reasonable terms under standard Service Occupation Agreements.

LOCAL MANAGER, KETTERING (Grades APT. 9/10, £755-£920).

Kettering is a non-manufacturing Unit comprising some 11,300 consumers, within the Wellingborough Group.

The house is semi-detached, three bedroomed, in residential district.

LOCAL SUPERINTENDENT, MELTON MOWBRAY (Grades APT. 6/7, £610-£750).

Melton Mowbray is a non-manufacturing Unit comprising some 4,500 consumers, within the Leicester Group.

The house is detached, four bedroomed, adjacent to the Station.

LOCAL SUPERINTENDENT, OAKHAM (Grades APT. 5/6, £575-£690).

Oakham is a non-manufacturing Unit comprising some 1,450 consumers, within the Leicester Group. The Local Superintendent would, in due course, be required to undertake certain standby duties, on a rota basis, in connection with the grid reception/holder station, for which an appropriate payment would be made.

The house is detached, four bedroomed, adjacent to the Station.

These appointments are pensionable, and the successful applicants will be required to pass a medical examination.

Applications stating age and present position, and giving details of education, qualifications and experience, together with the names of two referees, should be addressed to reach the undersigned not later than Wednesday, November 28, 1956.

H. B. TAYLOR,
Divisional General Manager.

Gas Offices,
Millstone Lane,
Leicester.

November 5, 1956.

SOUTHERN GAS BOARD

SALES AND SERVICE MANAGER—SOUTHAMPTON REGION

APPLICATIONS are invited from suitably qualified persons for the appointment of SALES AND SERVICE MANAGER to the Southampton Region.

The successful applicant will be responsible to the Commercial Manager, and will be based on Southampton.

Applicants must have proved administrative and organising ability, and successful experience in sales promotion. Previous experience in the Gas Industry, while an advantage, is not essential. The salary will be on the Senior Staff Scale Grade "E," £1,525 to £1,725, or "F," £1,675 to £1,925.

The successful applicant will be required to pass a medical examination and, unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required to join the Board's Staff Pension Scheme.

All applications must be on the Board's standard form, which may be obtained from the Personnel Manager, Southern Gas Board, 164, Above Bar, Southampton, and should be returned to him by November 30, 1956.

November 9, 1956.

SOUTHERN GAS BOARD

ADMINISTRATIVE ASSISTANT

APPLICATIONS are invited from suitably qualified persons for the appointment of ADMINISTRATIVE ASSISTANT to the Board.

The successful applicant will be responsible to the Commercial Manager, and will be based on Southampton.

Applicants must have proved administrative and organising ability, and successful experience in joint progressing and tele-communications. The salary will be on the Senior Staff Scale Grade "D," £1,375 to £1,575, or "E," £1,525 to £1,725, or by arrangement for an exceptional applicant.

The successful applicant will be required to pass a medical examination and, unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required to join the Board's Staff Pension Scheme.

All applications must be on the Board's standard form, which may be obtained from the Personnel Manager, Southern Gas Board, 164, Above Bar, Southampton, and should be returned to him by November 30, 1956.

November 9, 1956.

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Detailed applications, giving the names of two referees, should reach the General Manager, N.W.G.B. (North Cheshire Group), Great Portwood Street, Stockport, within 14 days.

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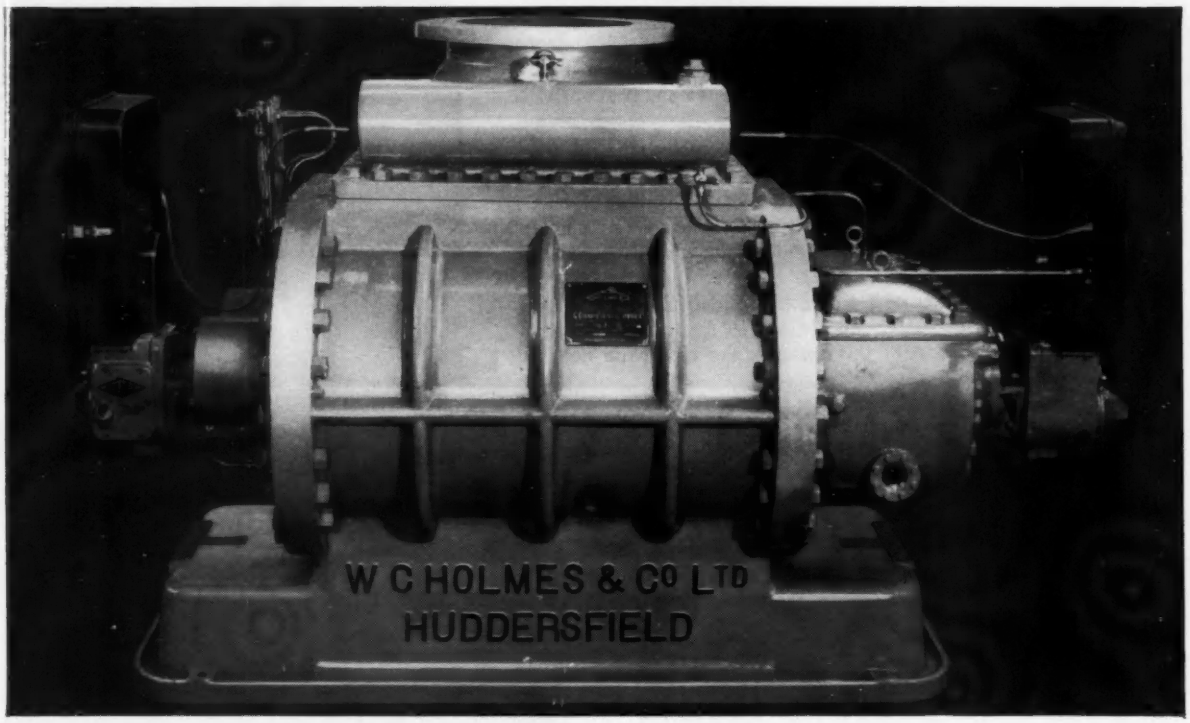

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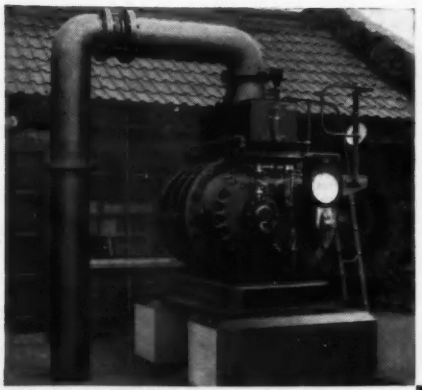

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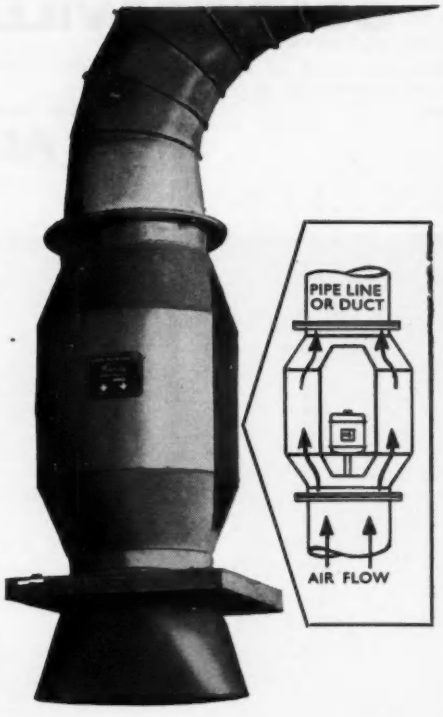

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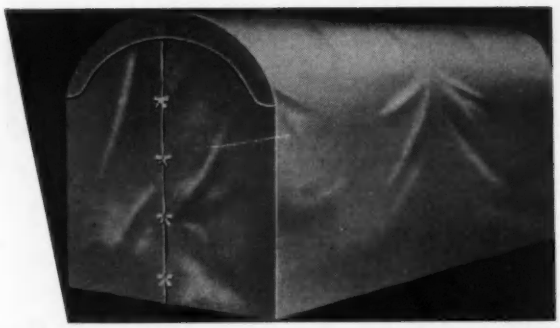

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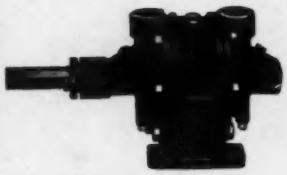

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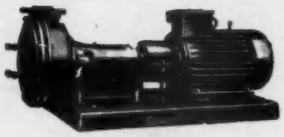
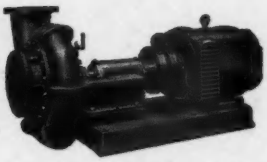
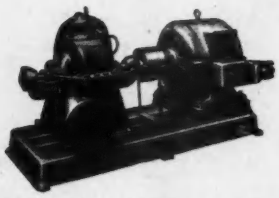


Stoneware pump for Corrosive and chemicals



Slurry pump for coal washing and abrasive liquids.



"HS" Type—for water services. All heads up to 500 feet.

"JA" & "JB" types for high temperature water circulation.

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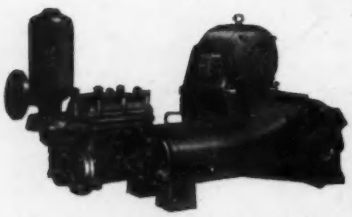

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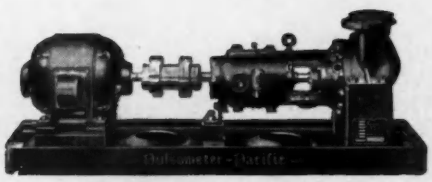

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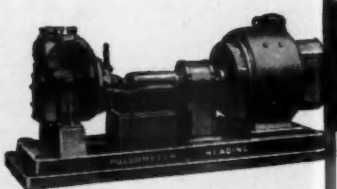

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